

OCTOBER 2014

INTERSTATE 64 / HIGH RISE BRIDGE CORRIDOR STUDY



CITY OF CHESAPEAKE, VA | STATE PROJECT #: 0064-131-783 | UPC: 104366

NATURAL RESOURCES TECHNICAL REPORT

TABLE OF CONTENTS

1.0	INTRODUCTION	1
1.1	Description of the Study Area.....	1
1.2	Alternatives Considered for Evaluation.....	2
1.2.1	No Build Alternative.....	2
1.2.2	Eight Lane Build Alternative	3
1.2.3	Eight Lane Build – Managed Alternative	3
1.2.4	Ten Lane Build Alternative.....	3
1.2.5	Ten Lane Build – Managed Alternative.....	3
1.3	Bridge Alternatives	4
1.3.1	Fixed-Span Bridge – 95 Foot – Vertical Clearance	4
1.3.2	Fixed-Span Bridge – 135 Foot – Vertical Clearance	4
1.4	Consulting Agencies	4
2.0	AQUATIC RESOURCES.....	7
2.1	WATERSHEDS.....	7
2.1.1	Western Branch Elizabeth River, HUC 020802080205.....	7
2.1.2	Deep Creek-Southern Branch Elizabeth River, HUC 020802080203	8
2.1.3	New Mill Creek-Southern Branch Elizabeth River, HUC 020802080201	8
2.2	Streams.....	8
2.2.1	Affected Environment.....	8
2.2.2	Environmental Consequences	10
2.3	WETLANDS.....	11
2.3.1	Affected Environment.....	11
2.3.2	Environmental Consequences	13
2.4	Permitting.....	14
2.5	Mitigation.....	15
2.5.1	Mitigation Credits	15
2.6	Floodplains.....	16
2.6.1	Affected Environment.....	16
2.6.2	Environmental Consequences	16
2.7	Water Quality	17
2.7.1	Affected Environment.....	17
2.7.2	Environmental Consequences	19
3.0	WILDLIFE AND HABITAT.....	19

3.1	Affected Environment.....	20
3.1.1	Terrestrial Wildlife and Habitat	20
3.2	Environmental Consequences	22
3.2.1	Terrestrial Wildlife and Habitat	22
4.0	THREATENED AND ENDANGERED SPECIES.....	24
4.1	Endangered Species	25
4.1.1	Affected Environment.....	25
4.1.2	Environmental Consequences	26
4.2	Threatened Species	27
4.2.1	Affected Environment.....	27
4.2.2	Environmental Consequences	28
5.0	REFERENCES	35

LIST OF TABLES

Table 1: Streams Identified within the Study Area.....	9
Table 2: Estimated Stream Impacts by Alternative.....	11
Table 3: Wetlands Identified within the Study Area.....	12
Table 4: Total Estimated Wetland Impacts by Alternative	14
Table 5: Total Estimated Floodplain Impacts by Alternative	17
Table 6: Impaired Waters in the Vicinity of the Study Area	18
Table 7: Estimated Forested Areas Impacts by Build Alternative	22
Table 8: Threatened and Endangered Species within Two Miles of the Study Area.....	24

LIST OF FIGURES

Figure 1: Study Area.....	6
Figure 2: Water Bodies	30
Figure 3: Wetlands.....	31
Figure 4: Floodplains	32
Figure 5: Forested Areas	33
Figure 6: Threatened and Endangered Species	34

APPENDICES

Appendix A: Agency Correspondence

Appendix B: Wetland Data Sheets

Appendix C: Unified Stream Methodology Forms

Appendix D: Surveyed Wetlands and Streams

Appendix E: VaFWIS Database Search

Appendix F: USFWS IPaC System Search

Appendix G: DCR-NHP Database Search

ACRONYM LIST

Center for Coastal Resource Management	CCRM
Center for Conservation Biology	CCB
Environmental Assessment	EA
Erosion & Sediment Control	ESC
Estuarine Intertidal Emergent	E2EM
Federal Emergency Management Agency	FEMA
Federal Highway Administration	FHWA
Flood Insurance Rate Map	FIRM
General Purpose	GP
Geographic Information Systems	GIS
High Occupancy Toll	HOT
High Occupancy Vehicle	HOV
Hydrological unit code	HUC
Information, Planning, and Conservation	IPaC
Mean high water	MHW
National Oceanic and Atmospheric Administration	NOAA
National Environmental Policy Act	NEPA
National Marine Fisheries Service	NMFS
National Wetland Inventory	NWI
National Wild and Scenic Rivers System	NWSRS
Nationwide Rivers Inventory	NRI
Palustrine Emergent	PEM
Palustrine Forested	PFO
Polychlorinated biphenyls	PCBs
Stormwater Management	SWM
Total Maximum Daily Load	TMDL

Unified Stream Methodology	USM
United States Army Corps of Engineers	USACE
United States Environmental Protection Agency	EPA
United States Fish and Wildlife Service	USFWS
United States Geological Survey	USGS
United States Government Printing Office	GPO
Virginia Department of Agriculture and Consumer Services	VDACS
Virginia Department of Conservation and Recreation	DCR
Virginia Department of Conservation and Recreation, Natural Heritage Program	DCR-NHP
Virginia Department of Environmental Quality	DEQ
Virginia Department of Forestry	DOF
Virginia Department of Game and Inland Fisheries	DGIF
Virginia Department of Health	VDH
Virginia Department of Transportation	VDOT
Virginia Marine Resources Commission	VMRC
Waters of the United States	WOUS

1.0 INTRODUCTION

The Virginia Department of Transportation (VDOT), in cooperation with the Federal Highway Administration (FHWA) as the lead federal agency, and the United States Coast Guard (USCG) has initiated the Interstate 64/High Rise Bridge Corridor Study to evaluate options to improve transportation conditions along the Interstate 64 (I-64) corridor between the Interstate 464 (I-464) interchange and the Interstate 664 (I-664) and Interstate 264 (I-264) interchanges at Bowers Hill in the City of Chesapeake, Virginia (Chesapeake). Pursuant to the National Environmental Policy Act of 1969, as amended, (NEPA) and in accordance with FHWA regulations, an Environmental Assessment (EA) has been prepared to analyze the potential social, economic, and environmental effects associated with the proposed project¹.

To support the EA, this Natural Resources Technical Report was prepared to document existing resources in the study area, to evaluate the potential impacts to these resources from the proposed transportation improvements, and discuss potential mitigation for unavoidable impacts.

1.1 Description of the Study Area

The study area for the Interstate 64/High Rise Bridge Corridor Study is located in the southwestern quadrant of the Hampton Roads Beltway, which is formed by a loop of I-64 and I-664 (**Figure 1**). The study area encompasses approximately eight-miles of I-64, consisting of two travel lanes in each direction, between the I-464 interchange and the I-664 and I-264 interchanges at Bowers Hill. It includes interchanges along I-64 at Military Highway (Route 13), George Washington Highway (Route 17), and Great Bridge Boulevard (VA Route 190). The G.A. Treacle Memorial Bridge (High Rise Bridge), a mile-long double-leaf drawbridge that spans the Southern Branch of the Elizabeth River, also is included in the study area.

Within the study area, I-64 connects to numerous businesses, homes, schools, and recreational opportunities throughout Chesapeake. Due to the loop that I-64 follows through the Hampton Roads region of the Commonwealth of Virginia (Virginia), I-64 West travels in an easterly direction and I-64 East travels westerly through the study area. For the purpose of this EA, I-64 will be described in terms of the road name and not the direction of the road.

The study area extends beyond the interchanges described above to ensure the impacts of any of the proposed transportation improvements are adequately documented. The study area consists of (**Figure 1**):

- Four interchanges (estimated at 3,000 feet in diameter/1,051 acres combined);
- Mainline along I-64 (100 feet on each side from existing edge of pavement – estimated at 327 acres); and,
- High Rise Bridge (600 feet from the center line for a total of 1,200 feet – estimated at 308 acres).

Additionally, as discussed in the *Alternatives Development Technical Report* (VDOT, 2014a), potential or estimated environmental impacts of the alternatives retained for detailed study were estimated based on the alternative's area of impact (or footprint) within the substantially larger study area. The area of

¹ NEPA and FHWA's regulations for Environmental Impact and Related Procedures can be found at 42 USC § 4332(c), as amended, and 23 CFR § 771, respectively.

impact has been estimated for alternative comparison purposes and decision-making during the NEPA process, but would be further refined if and when an alternative advanced to design.

1.2 Alternatives Considered for Evaluation

To address the identified purpose and need of the I-64/High Rise Bridge Corridor Study (See **EA Chapter 1.0**), alternatives were developed, as described in the *Alternatives Development Technical Report* (VDOT, 2014a). Initial analysis included Eight and Ten lane Build Alternatives. Prior to the completion of this technical report, FHWA and VDOT agreed to move forward with retaining the Eight lane Build Alternatives, as they would generally provide Level of Service “C” for the majority of the study area in the design year and be consistent with FHWA’s Performance Based Practical Design policy (FHWA, 2014). Details on the analyses conducted to support this decision are included in the *Alternatives Development Technical Report* (VDOT, 2014a) and the *Traffic and Transportation Technical Report* (VDOT, 2014c). Given the level of analysis that had occurred to inform this decision, data on the Eight and Ten lane alternatives are included in this technical report. Accordingly, the analyses of these alternatives are described in the following sections. Additionally, it should be noted that each of the alternatives described below would improve stormwater management, since the existing facility was constructed prior to the passage of the Clean Water Act, and thus does not have stormwater facilities to remove roadway generated pollutants. Should the project advance towards the design phase, the proposed facility would be designed to comply with both federal and state stormwater requirements in place at that time. The inclusion of stormwater management facilities into the proposed project would substantially improve stormwater runoff quality along the entire corridor.

Due to the number of possible managed lane scenarios, there have been no specific operational scenarios identified at this stage of the study. Accordingly, the following three operational scenarios were developed to establish a sample range of travel demand conditions for the Eight or Ten lane build – managed alternative: High Occupancy Vehicle (HOV), High Occupancy Toll (HOT), and All Tolled. For the purpose of this report, potential impacts associated with the Eight or Ten lane Build – Managed Alternative assume the same footprint as the respective general purpose (GP) Build Alternative. However it should be noted, of the three scenarios developed for this study, the HOV and All Tolled lane scenarios would fit within the footprint of the Build Alternative. Furthermore, if a specific managed lane scenario is identified as the Preferred Alternative, impact estimates could be updated in the Revised EA and associated technical reports.

1.2.1 No Build Alternative

In accordance with the regulations implementing NEPA (40 CFR § 1502.14(d)), the No Build Alternative has been included for evaluation in the EA to serve as a benchmark for the comparison of future conditions and impacts. The No Build Alternative would retain the existing I-64 interstate, associated interchanges and the High Rise Bridge in their present configurations, and allow for routine maintenance and safety upgrades. This alternative also assumes that the projects currently programmed and funded in VDOT’s Fiscal Year 2015-2020 Six-Year Improvement Program and the Hampton Roads Transportation Planning Organization’s Constrained Long Range Plan would be implemented as discussed in the *Alternatives Development Technical Report* (VDOT, 2014a) and the *Traffic and Transportation Technical Report* (VDOT, 2014c).

1.2.2 Eight Lane Build Alternative

This alternative would include construction of four additional lanes of capacity (two lanes in each direction) on I-64 within the study area. The eight lanes under this alternative are GP Lanes and are available for use without any restrictions or tolls. Wherever possible, the additional lanes would be constructed towards the existing median of I-64. The widening of I-64 to eight lanes also would require the reconstruction of I-264 ramp bridge over I-64 to the I-664 ramp; widening of I-64 bridge over Rotunda Avenue; improvements to Route 13 interchange; widening of I-64 bridges over Yadkin Road; improvements to Route 17 interchange; widening of I-64 bridge over Shell Road; extensions of the culvert along Gilmerton Deep Creek Canal; reconstruction of the High Rise Bridge (see bridge options discussed in **Section 1.3**); reconstruction of the Route 190 bridge over I-64; and improvements at the I-464 interchange.

1.2.3 Eight Lane Build – Managed Alternative

The Eight Lane Build – Managed Alternative would be similar to the Eight Lane Build Alternative, providing four additional lanes of capacity (two lanes in each direction) on I-64. However, some or all of the travel lanes would be managed using tolls and/or vehicle occupancy restrictions. Additionally, expanded local/express bus service or bus rapid transit could be accommodated with this alternative in the GP or the managed lanes. Numerous managed lane scenarios are possible depending on the type of strategy selected including, but not limited to, HOV lanes, HOT lanes, occupancy restrictions (at least 2 or 3 occupants), or time of day/day of week restrictions. The following three operational scenarios were evaluated to identify a sample range of potential conditions for this Build Alternative:

- HOV;
- All lanes tolled; or
- Two HOT Lanes + Two General Purpose Lanes (2 HOT / HOV-2 “free” + 2 GP).

This study does not identify what type of managed lane would be constructed. Moreover, if this alternative is identified as the Preferred Alternative, subsequent studies would be required to refine the specifics of the managed lanes throughout the study area. These specifics could include the identification of additional costs and impacts not quantified as part of this study, including those associated with providing access between the GP and managed lanes at interchanges and/or between interchanges.

1.2.4 Ten Lane Build Alternative

This alternative would include construction of six additional lanes of capacity (three lanes in each direction) within the study area. The ten lanes under this alternative are GP Lanes and are available for use without any restrictions or tolls. Wherever possible, the additional lanes would be constructed towards the existing median of I-64. The widening of I-64 to ten lanes also would require the reconstruction of I-264 ramp bridge over I-64 to the I-664 ramp; widening of I-64 bridge over Rotunda Avenue; improvements to Route 13 interchange; widening of I-64 bridges over Yadkin Road; improvements to Route 17 interchange; widening of I-64 bridge over Shell Road; extensions of the culvert along Gilmerton Deep Creek Canal; reconstruction of the High Rise Bridge (see bridge options discussed in **Section 1.3**); reconstruction of the Route 190 bridge over I-64 and improvements at the I-464 interchange.

1.2.5 Ten Lane Build – Managed Alternative

The Ten Lane Build – Managed Alternative would be similar to the Ten Lane Build Alternative, providing five continuous mainline lanes in each direction of I-64. However, some or all of the travel lanes would

be managed using tolls and/or vehicle occupancy. Additionally, expanded local/express bus service or bus rapid transit could be accommodated with this alternative in the GP or the managed lanes. Numerous managed lane scenarios are possible depending on the type of strategy selected including, but not limited to, HOV lanes, HOT lanes, occupancy restrictions at least 2 or 3 occupants, or time of day/day of week restrictions. The following three operational scenarios were evaluated to identify a sample range of potential conditions for this Build Alternative:

- HOV;
- All lanes tolled; or
- Two HOT Lanes + Two General Purpose Lanes (2 HOT / HOV-2 “free” + 2 GP).

This study does not identify what type of managed lane would be constructed. Moreover, if this alternative is identified as the Preferred Alternative, subsequent studies would be required to refine the specifics of the managed lanes throughout the study area. These specifics could result in the identification of additional costs and impacts not quantified as part of this study, including those associated with providing access between the GP and managed lanes at interchanges and/or between interchanges.

1.3 Bridge Alternatives

1.3.1 Fixed-Span Bridge – 95 Foot – Vertical Clearance

This alternative would consist of high-level, fixed-span bridges measuring 95-feet during mean high water (MHW). This alternative would include the construction of a new bridge carrying eastbound traffic south of the existing bridge. The proposed eastbound roadway approach would be shifted south, by approximately 100 feet, to tie in with the proposed location of the new bridge. The existing I-64 drawbridge would remain in service during the construction of the new bridge but could then be demolished to build a new fixed span bridge to current design standards. Additionally, this alternative includes consideration of widening the horizontal clearance from 125-feet to 135-feet. The typical section would vary to match the mainline alternative; however, the bridge would include 14-foot wide shoulders on the inside and outside due to the high truck volume that utilizes I-64, VDOT Bridge Design Manual (VDOT, 2014b).

1.3.2 Fixed-Span Bridge – 135 Foot – Vertical Clearance

This alternative would consist of high-level, fixed-span bridges measuring 135-feet during MHW. This alternative would include the construction of a new bridge carrying eastbound traffic south of the existing bridge. The proposed eastbound roadway approach would be shifted south, by approximately 100 feet, to tie in with the proposed location of the new bridge. The existing I-64 drawbridge would remain in service during the construction of the new bridge but could then be demolished to build a new fixed span bridge to current design standards. Additionally, this alternative includes consideration of widening the horizontal clearance from 125-feet to 135-feet. The typical section would vary to match the mainline alternative; however, the bridge would include 14-foot wide shoulders on the inside and outside due to the high truck volume that utilizes I-64, VDOT Bridge Design Manual (VDOT, 2014b).

1.4 Consulting Agencies

Natural resources within the study area were identified based on agency input through the scoping process, agency meetings, review of existing available scientific literature, Geographic Information

System (GIS) databases and mapping, and field reconnaissance conducted in October and November of 2013 and in April 2014. The following agencies and groups were sent scoping letters requesting information regarding sensitive natural resources or other key environmental issues within the study area:

- Chesapeake Bay Local Assistance
- The Elizabeth River Project
- Federal Emergency Management Agency (FEMA)
- National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS)
- United States Department of Agriculture, Natural Resources Conservation Service
- United States Army Corps of Engineers, Norfolk District (USACE)
- United States Coast Guard
- United States Department of the Interior, Fish and Wildlife Service (USFWS)
- United States Department of the Interior, National Park Service
- United States Department of the Interior, Office of Environmental Policy and Compliance
- United States Environmental Protection Agency (EPA)
- Virginia Department of Agriculture and Consumer Services (VDACS)
- Virginia Department of Conservation and Recreation, Natural Heritage Program (DCR-NHP)
- Virginia Department of Environmental Quality (DEQ)
- Virginia Department of Forestry (DOF)
- Virginia Department of Game and Inland Fisheries (DGIF)
- Virginia Department of Health (VDH)
- Virginia Department of Mines, Minerals, and Energy
- Virginia Marine Resources Commission (VMRC)
- Virginia Maritime Association
- Virginia Outdoors Foundation

A more thorough discussion regarding data gathering sources and approach are presented within the discussion of each resource in **Section 2.0, 3.0, and 4.0**. Correspondence with the agencies and groups listed above are included in **Appendix A** of this Technical Report.

- I 64/High Rise Bridge
Corridor Study Area*
- Water Bodies
- Great Dismal Swamp

State Project Number: 0064-131-783, P101; UPC: 104366
Federal Project Number: NH-IM-064-3(481)

Figure 1 Study Area

Interstate 64/High Rise Bridge Corridor Study Natural Resources Technical Report

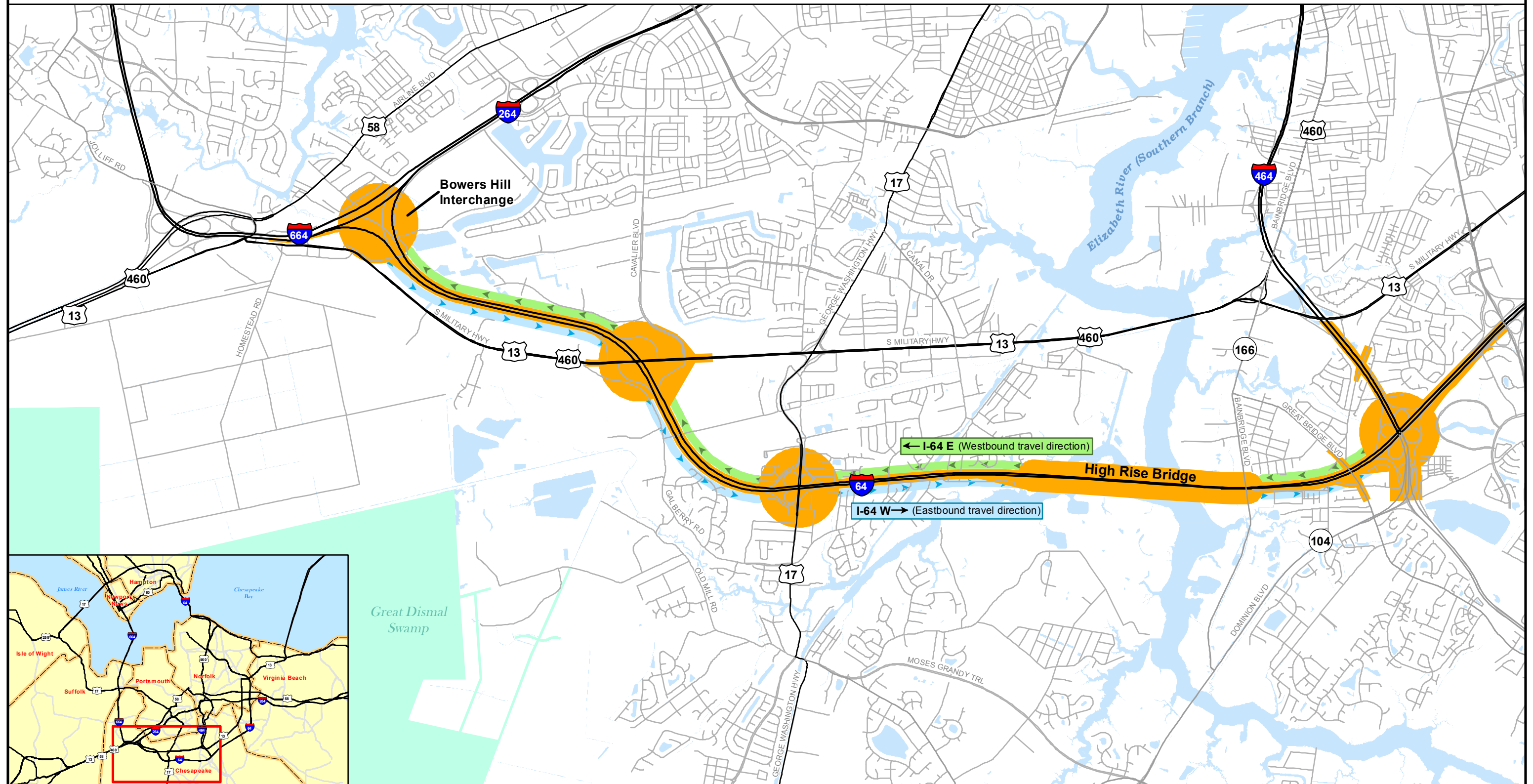
City of Chesapeake

*The study area is a buffer around the road corridor that includes all natural, cultural and physical resources that must be analyzed in the NEPA document. It does not imply right-of-way take or construction impact.

Mapping Source: VDOT and City of Chesapeake



0 0.25 0.5 1 1.5 Miles



2.0 AQUATIC RESOURCES

This chapter describes the aquatic resources associated with the Interstate 64/High Rise Bridge Corridor Study. The purpose of this section is to identify and analyze the environmental consequences resulting from the proposed improvements. Resources discussed include the watersheds, wetlands, streams, floodplains and water quality. Aquatic wildlife is discussed in **Section 3.0**.

In order to determine the potential effects of the proposed improvements on floodplains and Waters of the United States (WOUS), including wetlands, and other water bodies; surface waters were identified based on a review of available aerial photography, topographic maps produced by the United States Geological Survey (USGS) (USGS, 2012), USFWS National Wetland Inventory (NWI) database (USFWS, 2013A), and FEMA Flood Insurance Rate Maps (FIRMs) (FEMA, 1999).

Following initial desktop reviews, field investigations were conducted in October and November 2013 and in April 2014 to confirm the existence of streams, wetlands, and floodplains within the study area. **Figure 2** illustrates the water bodies identified within the study area. The wetland areas were documented on Wetland Data Sheets in order to characterize the types of wetlands located within the study area. The Wetland Data Sheets are included in **Appendix B** of this Technical Report. Unified Stream Methodology (USM) forms were completed for field-verified non-tidal streams. The USM forms are included in **Appendix C** of this Technical Report. A formal wetland and stream delineation was not conducted, as a more detailed field review of aquatic resources would be performed if and when an alternative advanced to design. The Wetland Data Sheets and USM forms were completed for the purposes of this study and were not completed in order to initiate or facilitate a permitting process.

2.1 WATERSHEDS

Surface waters in the study area flow into either the Western Branch of the Elizabeth River or the Southern Branch of the Elizabeth River, discharge into the James River, and ultimately into the Chesapeake Bay. The *National Watershed Boundary Dataset* (USGS, 2013) was utilized to identify the watersheds within the study area. A discussion of the watersheds follows to facilitate a better understanding of the location and flow of the surface waters within the study area. Impact analyses are provided for the specific surface waters within the watershed following this section.

The *National Watershed Boundary Dataset* identifies the Elizabeth River watershed hydrologic unit code (HUC) as 0208020802 and has an area of approximately 201 square miles. This watershed is further delineated into smaller subwatersheds. There are three subwatersheds that intersect the study area and are detailed in the descriptions that follow.

2.1.1 Western Branch Elizabeth River, HUC 020802080205

The northwestern portion of the study area is located in the Western Branch of the Elizabeth River subwatershed. Surface waters in the vicinity of the Bowers Hill interchange flow north into Goose Creek. Goose Creek discharges into the Western Branch of the Elizabeth River to the north of the study area. This subwatershed is approximately 40 square miles.

2.1.2 Deep Creek-Southern Branch Elizabeth River, HUC 020802080203

The majority of the study area is located in the Deep Creek-Southern Branch of the Elizabeth River subwatershed, which is approximately 45 square miles. The direction of the surface water flow is discussed below.

- North of the Route 13 interchange, surface waters flow to the north and east toward Saint Julian Creek;
- North of I-64 and south of Route 13, surface waters flow toward the Gilmerton Deep Creek Canal, Deep Creek, and the Southern Branch of the Elizabeth River;
- South of I-64, surface waters generally flow south and east towards Deep Creek; and,
- East of the Southern Branch of the Elizabeth River, surface waters flow north and west towards Hodges Creek and Newton Creek before flowing into the river.

All surface waters in this subwatershed ultimately flow into the Southern Branch of the Elizabeth River.

2.1.3 New Mill Creek-Southern Branch Elizabeth River, HUC 020802080201

The southeastern portion of the study area is located in the New Mill Creek-Southern Branch of the Elizabeth River subwatershed. This is the smallest of the three subwatersheds, with a total area of approximately 26 square miles. Surface waters generally flow to the south and west towards Mains Creek, which discharges into the Southern Branch of the Elizabeth River.

2.2 Streams

Within each of these USGS delineated watersheds and subwatersheds, surface water drainage takes place through rivers, streams, and ditches that run through the study area. Preliminary information regarding the presence of streams was obtained from USGS topographic maps and available aerial photography. Field investigations were subsequently performed to verify the existence of streams in and around the study area. Based on the data and field investigations, GIS shapefiles were generated to calculate the total length of streams and rivers within the study area.

2.2.1 Affected Environment

Streams

The Southern Branch of the Elizabeth River, the Gilmerton Deep Creek Canal, and several streams and unnamed tributaries intersect the study area. The Western Branch of the Elizabeth River is located outside of the study area but is fed by some of these tributaries. The streams that were field verified to intersect the study area include Hodges Creek, Newton Creek, and unnamed tributaries of Goose Creek and Deep Creek. The location of each water body is illustrated in **Figure 2** and the lengths of the stream segments within the study area are listed in **Table 1**. USM forms were completed for field-verified non-tidal streams and are included in **Appendix C** of this Technical Report.

Table 1: Streams Identified within the Study Area

River/Stream	Stream Lengths Within Study Area (linear feet)
Deep Creek south of the High Rise Bridge and parallel to I-64	3,700
Deep Creek north of the High Rise Bridge	1,600
Verified tidal unnamed tributary of Deep Creek north of the High Rise Bridge	950
Hodges Creek, tidal and non-tidal, north of the High Rise Bridge	3,200
Verified non-tidal unnamed tributary of Goose Creek	6,061
Verified non-tidal unnamed tributary of Deep Creek	1,527
Verified non-tidal unnamed tributary of Newton Creek	5,363

Stream field surveys characterized non-tidal tributaries within the study area associated with three named streams, including tributaries of Goose Creek located near the Bowers Hill interchange, one tributary of Deep Creek located east of the Route 17 interchange, and tributaries of Newton Creek located near the I-464 interchange. The stream reaches associated with tributaries of Goose Creek are generally characterized as shaded through mostly mature forested areas with marginal channel conditions due to past ditching, relocations, and some erosion. Reach 8 was the least degraded stream with a healthy riparian buffer, lack of ditching, and optimal habitat. The stream reach associated with the tributary of Deep Creek is characterized as partially shaded with suboptimal channels due to some erosion, past ditching, and relocation, with a portion of the stream bank being armored with concrete and brick through a residential area. The stream reaches associated with the tributaries of Newton Creek are generally characterized as shaded from trees (except for Reach 1 that flows through the Roosevelt Memorial Park cemetery and Reach 16 that partially flows through a residential property), marginal channel condition due to ditching and relocation of the channels adjacent to roadways, and lack of extensive riparian buffers. Descriptions of each stream area reach within the study area are located within the USM forms included in **Appendix C** of this Technical Report. The location of each of the surveyed USM stream reaches is included in **Appendix D** of this Technical Report.

Wild and Scenic Rivers

A review of the National Wild and Scenic Rivers System (NWSRS) database reveals that, of the approximately 49,350 miles of river in Virginia, none are designated as National Wild and Scenic Rivers (NWSRS, 2013). Therefore, there are no designated National Wild and Scenic Rivers in the study area.

The Nationwide Rivers Inventory (NRI) is a listing of 3,400 free-flowing river segments in the United States that are believed to possess one or more “outstanding remarkable” natural or cultural values to be of more than local or regional significance. According to the NRI database, there are no Virginia river segments located in the study area (National Park Service, 2009).

In addition, the Virginia Department of Conservation and Recreation (DCR) maintains a list of rivers that are designated as scenic in Virginia. The Virginia Scenic Rivers Program identifies and helps to protect rivers and streams in the state of Virginia that possess outstanding scenic, recreational, historic and natural characteristics of statewide significance. According to DCR’s list of Virginia Scenic Rivers (DCR, 2013A), there are no scenic rivers or streams within the study area.

Ditching

Throughout the study area there are the remnants of historical agricultural ditching, roadside ditching, and possibly ditched stream channels. The majority of the ditches in the study area do not follow the natural topography of the watershed where stream channels would have occurred historically. Chesapeake GIS data was used to identify ditching that was historically present. These features were assessed in the field to determine if they are still present and if they conveyed flow. By comparing the mapping of extensive agricultural ditches included in the Chesapeake GIS data to existing land uses, it was determined that many historical ditches appear to have been destroyed and/or relocated adjacent to the roadways during construction of I-64 and surrounding developments. Deep ditching along some sections of the interstate is 10 to 20 feet wide and up to 10 feet below the surface of the roadway. These deep roadside ditches effectively drain a large zone along their length, limiting the hydrology available to support wetlands.

Ditching within the study area may or may not be jurisdictional, depending on its origin, existing condition, and state of maintenance. This analysis did not attempt to separate jurisdictional ditches from non-jurisdictional ditches, which requires coordination with USACE. This analysis focused on identification of headwater stream channels, both ditched and not ditched, which occur in the study area. Coordination with USACE would occur as part of the permitting process to determine agency jurisdiction over ditches and all WOUS if and when an alternative is advanced to the design phase.

2.2.2 Environmental Consequences

Under the No Build Alternative, there would be no new stream impacts as a result of interstate improvements within the study area. Most of the tidal streams located within the study area are in the vicinity of the High Rise Bridge (**Figure 2**). As a result, most of the estimated tidal stream impacts would occur as a result of the construction of new bridge alternatives. The proposed alternatives include an Eight lane and a Ten lane alternative and two bridge height alternatives (95-foot and 135-foot), as described in **Section 1.3** and in the *Alternatives Development Technical Report* (VDOT, 2014a). All of the new bridge alternatives would span approximately 2,800 feet across the width of the Southern Branch of the Elizabeth River and Deep Creek, similar to the existing High Rise Bridge. Estimated permanent stream impacts would result from construction of new bridge piers and abutments for the bridge structure. The piers would require piles to be driven into the river bottom, which would be the estimated permanent impact. However, the number and size of the piles would not be typically determined until final design. Assumptions were made that piers would be 20 feet in width and extend the entire width of the bridge superstructure. There would be two bridges, one for each traffic direction. The width of the bridge superstructures would be approximately 80 feet for the four lane bridge alternative and approximately 92 feet for the five lane alternative. The total area of each of the piers would be approximately 1,600 square feet for the four lane bridge alternative and approximately 1,840 square feet for the five lane alternative. It would be assumed that piers would be placed approximately 150 feet apart along the length of the bridge. Estimated permanent roadway impacts west of the bridge would affect additional tidal streams including the Gilmerton Deep Creek Canal and the western portion of Deep Creek. The portion of Deep Creek west of the bridge would be impacted by fill required for the roadway. It is anticipated that the alternatives would not impact Hodges Creek. The total estimated stream impacts from each of the alternatives are included in **Table 2**.

Table 2: Estimated Stream Impacts by Alternative

Alternative	No Build	8 95	8 135	10 95	10 135
Estimated Tidal River & Deep Creek Pier Impacts (acres)	0.00	1.25	1.26	1.42	1.43
Additional Estimated Tidal Streams Roadway Impacts (acres)	0.00	0.89	0.62	1.25	0.95
Total Estimated Pier and Roadway Tidal Stream Impacts (acres)	0.00	2.14	1.88	2.67	2.38
Total Estimated Non-Tidal Stream Impacts (linear feet)	0.00	5,098	5,098	5,169	5,169

The Ten lane, 95-foot high bridge alternative would have the most estimated total tidal stream/river impacts (2.67 acres) from piers and roadway fill. The alternative with the least estimated total tidal stream/river impacts (1.88 acres) from piers and roadway fill would be the Eight lane, 135-foot high alternative. The two bridge alternatives would impact approximately the same area of tidal streams as a result of the piers. The 95-foot bridge alternatives would impact more tidal river/streams area because they have fewer piers and more roadway atop fill. Approximately 5,100 linear feet of the non-tidal streams within the study area are located in interchange areas and are therefore assumed to be impacted (**Figure 2**). If and when the project moves forward into design, additional avoidance and minimization measures may be possible once the interchanges are properly identified.

2.3 WETLANDS

Preliminary information regarding the presence of wetlands was obtained from the USFWS NWI maps, inferences made based on USGS topographic maps, and the most recent 2013 aerial photography. Field investigations were completed to verify the existence of wetlands in the study area. The wetland determination was completed per USACE Regional Supplement to the USACE Wetland Delineation Manual: *Atlantic and Gulf Coastal Plain Region* (Version 2.0) (USACE, 2010). The wetland areas were documented on Wetland Data Sheets to characterize the types of wetlands located within the study area. The Wetland Data Sheets are included in **Appendix B** of this Technical Report. Based on this data, GIS shapefiles were generated to calculate the total acreage of wetlands. To classify identified wetlands, this report uses an abbreviated version of the classification system developed by the USFWS, which was derived from the *Classification of Wetland and Deepwater Habitats* (Cowardin et al., 1979).

2.3.1 Affected Environment

Field-identified wetlands fall into two wetland systems:

- Palustrine System - includes non-tidal wetlands dominated by trees, shrubs, and herbaceous vegetation; and
- Estuarine System - includes tidal wetlands in brackish water along the Elizabeth River, Deep Creek, Hodges Creek, and other tidal waters.

Figure 3 depicts the wetlands identified within the study area. More detailed locations of each of the surveyed wetlands and streams are depicted in **Appendix D** of this Technical Report.

Within the study area, a total of 78 wetlands were field identified covering approximately 91 acres. Approximately 49 acres of the wetlands are non-tidal. Of these non-tidal wetlands, approximately five

acres are classified as emergent (PEM) wetlands and 44 acres are considered forested (PFO) wetlands. The remaining 43 acres of wetlands are intertidal emergent (E2EM), defined by brackish tidal wetlands with primarily herbaceous vegetation. The large acreage of tidal wetlands reflects the 1,200-foot wide study corridor across the Southern Branch of the Elizabeth River and Deep Creek.

Table 3 provides a breakdown of the various classes of wetlands within the study area and is followed by a description of each.

Table 3: Wetlands Identified within the Study Area

Wetland Class	Description	Wetland Area (Acres)
PEM	Palustrine Emergent (Non-tidal herbaceous)	4.75
PFO	Palustrine Forested (Non-tidal forested)	44.07
E2EM	Estuarine Intertidal Emergent (Tidal herbaceous)	42.54
Total Wetlands within the study area		91.37

Palustrine Emergent (PEM) Wetlands

There are 18 field identified PEM wetlands within the study area covering an estimated 4.8 acres. Most of these PEM wetlands are located near the Bowers Hill interchange, the I-464 interchange, and the eastern terminus of the High Rise Bridge. More detailed locations of each of the surveyed wetlands and streams are depicted in **Appendix D** of this Technical Report. The PEM wetlands located near the Bowers Hill interchange (Wetlands 1, 3, and 4A) are floodplain wetlands that likely are temporarily flooded during rain events and are dominated by common reed (*Phragmites australis*); rice cut grass (*Leersia oryzoides*), woolgrass (*Scirpus cyperinus*), giant cane (*Arundinaria gigantea*), and swamp rosemallow (*Hibiscus moscheutos*). The PEM wetlands located near the I-464 interchange (Wetlands 67, 68, 69, and 70) are temporarily flooded from surface runoff and dominated by fern flat sedge (*Cyperus filiculmis*), soft rush, common reed, Japanese honeysuckle, poison ivy (*Toxicodendron radicans*) with a small number of red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*), and wax myrtle (*Morella cerifera*) in the shrub layer. The PEM wetlands located near the eastern terminus of the High Rise Bridge (Wetlands 59, 60, and 61) are likely seasonally saturated during the winter and spring and are dominated by soft rush (*Juncus effusus*), giant cane, blackberry species (*Rubus* spp.), dog fennel (*Eupatorium capillifolium*), seedbox (*Ludwigia alternifolia*), goldenrod species (*Solidago* spp.) and Japanese honeysuckle (*Lonicera japonica*). A review of the NRCS Web Soil Survey reveals soils associated with these wetlands include Nawney silt loam, Rappahannock muck, Urban Land-Conetoe-Chesapeake-Tetotum complex, Udorthents-Urban Land complex, Munden-Urban Land complex, and Tomotley-Urban Land-Nimmo complex soils.

Palustrine Forested (PFO) Wetland

There are 17 field identified PFO wetlands within the study area covering an estimated 44.1 acres. More detailed locations of each of the surveyed wetlands and streams are depicted in **Appendix D** of this Technical Report. The forested wetlands are located near every interchange in the study area and the largest forested wetlands are located near the Bowers Hill interchange and the Route 13 interchange. The forested wetlands located near the Bowers Hill interchange (Wetlands 4, 6, and 7) are dominated by red maple, sweetgum, black gum (*Nyssa sylvatica*) in the tree stratum, lizard's tail (*Saururus cernuus*) and netted chain fern (*Woodwardia areolata*) in the herbaceous stratum, and greenbriar (*Smilax rotundifolia*) and Japanese honeysuckle in the woody vine stratum. These wetlands were predominantly mature mixed forests that are likely seasonally saturated during the winter and spring. Of the approximately 44 total

acres of non-tidal forested wetlands identified in the study area, over 25% is a single 12-acre hardwood forested wetland at the Route 13 interchange (Wetland 8). Wetland 8 is dominated by red maple, sweetgum, black gum, and water oak (*Quercus nigra*) in the tree layer and coastal sweet-pepperbush (*Clethra alnifolia*), highbush blueberry (*Vaccinium corymbosum*) and sweetbay magnolia (*Magnolia virginiana*) in the sapling stratum. This wetland is probably seasonally saturated with extensive surface ponding in the winter and spring. Soil types associated with forested wetlands include Nawney silt loam, Munden-Urban Land complex, Tomotley-Deloss complex, Tomotley-Urban Land-Nimmo complex, Udorthents-Urban Land complex, Pocaty Mucky Peat, Tomotley-Urban Land complex, and Dragston-Urban Land-Tomotley complex.

Estuarine Intertidal Emergent (E2EM) Wetland

The estuarine intertidal emergent wetlands are primarily associated with the tidal areas bordering the Southern Branch of the Elizabeth River, Deep Creek, and the Gilmerton Deep Creek Canal. There are 43 field identified E2EM wetlands covering an estimated 42.5 acres within the study area. More detailed locations of each of the surveyed wetlands and streams are depicted in **Appendix D** of this Technical Report. Approximately 16 of the 43 tidal wetlands encompassing 11.9 acres are designated as E2EM5 wetlands because they are dominated by common reed. The common reed is listed as a highly invasive species by DCR (2009). The E2EM5 wetlands are generally located close to the interstate and/or close to the railroad tracks near the eastern terminus of the High Rise Bridge. There are five common reed-dominated wetlands located near I-64 and are associated with Deep Creek, seven adjacent to I-64 west of the Southern Branch of the Elizabeth River, and three more near Hodges Creek and the railroad tracks servicing an industrial parcel east of the Southern Branch of the Elizabeth River. These wetlands are generally characterized by 90% or more absolute cover with common reed and generally flood daily with brackish water. The remaining 26 E2EM wetlands are characterized by the following herbaceous plants: salt meadow cord grass (*Spartina patens*), saltwater cord grass (*Spartina alterniflora*), big cord grass (*Spartina cynosuroides*), Roemer's rush (*Juncus roemerianus*), and common reed. The following shrubs are also occasionally observed: groundseltree (*Baccharis halimifolia*), wax myrtle and Jesuit's bark (*Iva frutescens*). The marshes dominated by *Spartina* species also experience daily tidal flooding with brackish water. Soils associated with these wetlands include Munden-Urban Land complex, Nawney silt loam, Pocaty Mucky Peat, Rappahannock muck, Bojac-Urban Land-Wando complex, Wando loamy fine sand, Dragston fine sandy loam, Udorthents-Urban Land complex, and Dragston-Urban Land complex.

Approximately 1.23 acres of the 7.5-acre Chesapeake Land Development Tidal Bank is located within the study area. As of September 2014, there were 95,581.5 tidal wetland credits available (USACE, 2014). A credit is typically equal to a square foot of restored tidal wetlands. In addition to the mitigation bank, a constructed tidal wetland mitigation site was identified north of Hodges Creek within the study area. Approximately two acres of this mitigation site is located within the study area.

2.3.2 Environmental Consequences

Under the No Build Alternative, there would be no wetland impacts as a result of interstate improvements within the study area. All Build Alternatives would have impacts to both tidal and non-tidal wetlands. For each of the Build Alternatives being considered, wetlands would be impacted by roadway widening, bridge piers and abutments, interchange modifications, and SWM. Impacts to wetlands have been avoided to the greatest extent possible through the alternatives screening process, furthermore if and when the project moves forward into design, additional avoidance and minimization measures may be possible,

see the *Alternatives Development Technical Report* (VDOT, 2014a). The estimated wetland impacts were calculated for each alternative and are included in **Table 4**.

Table 4: Total Estimated Wetland Impacts by Alternative

Alternative		No Build	8 95	8 135	10 95	10 135
Non-Tidal	Estimated Forested (PFO) Wetland Impacts (acres)	0.00	18.34	18.34	18.38	18.38
	Estimated Emergent (PEM) Wetland Impacts (acres)	0.00	1.00	1.00	1.06	1.06
	Estimated Total Non-Tidal Impacts (acres)	0.00	19.34	19.34	19.44	19.44
Tidal	Estimated (E2EM) Wetland Fills Impacts (acres)	0.00	3.02	1.39	4.04	1.98
	Estimated (E2EM) Wetland Piers Impacts (acres)	0.00	0.00	0.07	0.00	0.09
	Estimated (E2EM) Wetland Mitigation Bank Impacts (acres)	0.00	0.20	0.20	0.26	0.26
	Estimated Total Tidal Wetland Impacts (acres)	0.00	3.02	1.46	4.04	2.07
Total Wetland Impacts (acres)		0.00	22.37	20.59	23.48	21.23

Most of the estimated non-tidal wetland impacts would be to two large PFO wetlands located at the Route 13 interchange. As noted in the *Alternatives Development Technical Report* (VDOT, 2014a), specific interchange designs have not yet been committed to at this stage and the relatively large estimated PFO impacts are a result of the assumption that all areas within an interchange are assumed to be impacted. Should the project move forward, future designs will determine the actual impacts and how they can be avoided and mitigated. For the purposes of this study, a worst case scenario is presented and all wetlands are assumed to be impacted within the interchanges. Estimated impacts to PEM wetlands result in approximately one acre for each of the alternatives. The estimated impacts to tidal wetlands resulting from bridge piers have been calculated based upon the assumptions made in **Section 2.2.2**. The impacts to tidal wetlands beneath the bridges would result from the area of the piers, which is assumed to be 20 feet in width and extend the width of the bridge superstructure. The permanent impacts east and west of the bridges result from impacts of placing fill beneath the roadway. Additional tidal wetland impacts would result to the Chesapeake Land Development Tidal Bank property from each Build Alternative due to the relocation of existing Libertyville Road to the south. No impacts are anticipated to the wetland mitigation site identified north of Hodges Creek. Most of the estimated tidal wetland impacts would result from roadway fill impacts. As a result, the 95-foot bridge alternatives impact more tidal wetlands because they have fewer piers and more roadway atop fill. The highest estimated tidal wetland impacts (4.04 acres) would result from the ten lane, 95-foot high alternative. The lowest estimated tidal wetland impacts (1.26 acres) would result from the eight lane, 135-foot high alternative. The key difference between the impacts for the alternatives is that the wider and shorter alternatives affect more land due to having fewer piers and more roadway fill, resulting in more wetland impacts.

2.4 Permitting

If and when an alternative is advanced to design, VDOT would apply for all appropriate permits as a result of unavoidable impacts to natural resources such as wetlands and streams. The permit process would only proceed once the NEPA process is concluded, a decision document is issued, funding is

secured, and preliminary design has been completed. An Individual Permit would likely be required and would be acquired by following the Joint Permit Application process. The permit application would be developed and submitted to VMRC, which acts as the clearinghouse and forwards the application to all appropriate agencies for comment and/or permit issuance, including the USACE, DEQ, and Local Wetland Boards. Furthermore, according to the Center for Coastal Resource Management (CCRM), VMRC acts as the Local Wetland Board in Chesapeake (CCRM, 2014). Permits for grading and land disturbance, erosion and sediment control and stormwater management also would be required from the DEQ Virginia Stormwater Management Program and from Chesapeake. In order to adhere to the conditions of all permits that would be issued for this undertaking, continued coordination with all appropriate federal and state agencies would continue as necessary, prior to and during design and construction.

The bridge would be protected from accidental ship impacts by pile-like structures called dolphins. The number and size of these structures would be developed during the design process based on water depth and the design of the bridge. The dolphins would be driven into the river bottom similar to the bridge piles. The permanent impact of the dolphins to the river would be included in the permitting process and are not included in the impact analysis discussed above.

2.5 Mitigation

If and when an alternative advances to design, efforts would be made to avoid or minimize potential impacts to wetlands and streams. Mitigation involves avoiding and minimizing direct impacts, and compensating for unavoidable impacts. Non-tidal stream impacts would be compensated through purchase of stream credits or onsite restoration of degraded streams. The USM would be used to determine stream quality, assess stream impacts, and determine the compensation requirements. If mitigation includes onsite restoration or enhancement, the USM method would be used to determine whether proposed restoration would meet the mitigation requirements (USACE, 2007). Mitigation of tidal stream or river impacts would be determined during the permitting stages with the appropriate agencies during the Section 404 permitting process with VMRC, USACE and DEQ. Unavoidable impacts to wetlands from widening the existing roadway would occur as numerous wetlands have been identified adjacent to I-64. The roadway alternatives would incorporate features that avoid and/or minimize impacts to wetlands, such as constructing lanes adjacently north of existing lanes, south of existing lanes, within the median, or a combination of these. During final design, additional avoidance and minimization measures may be possible. Once the final engineering design is complete, surface water impacts would be calculated and would provide the basis upon which wetland and stream mitigation would be determined. Typical mitigation options include on-site mitigation and/or the purchase of mitigation credits. The potential mitigation option considered for this study is listed below.

2.5.1 Mitigation Credits

The purchase of wetland and/or stream mitigation credits from a commercial mitigation bank, or the use of existing credits from one of VDOT's mitigation banks, could be used to meet the mitigation requirements, if and when an alternative advances to design. For impacts to tidal wetlands, VDOT may have sufficient credits available at its Goose Creek Wetland Bank to provide mitigation for wetland impacts. For tidal and non-tidal wetland and stream credits, there are several commercial mitigation banks servicing the Hampton Roads watershed (HUC 02080208). As of April, 2014, five wetland mitigation banks had available credits that service the Hampton Roads watershed (USACE, 2014):

- Buckhorn Wetland Mitigation Bank – approximately 4.28 available non-tidal wetland credits;
- Chesapeake Wetland Mitigation Bank – approximately 273.69 available non-tidal wetland credits;
- Chesapeake Land Development Tidal Bank – approximately 97,041.50 available tidal wetland credits;
- Lewis Farm Wetland Bank – approximately 132.70 available non-tidal wetland credits; and,
- VDOT-Goose Creek Tidal Wetland Mitigation Bank – approximately 119,478.20 available E2EM – high marsh credits, 23,031.60 available tidal wetland credits, 2.06 available non-tidal wetland credits.

In addition, the proposed Steel Street Tidal Mitigation Bank may have additional tidal mitigation credits available in the HUC 02080208 area in the near future (Priest, 2014).

2.6 Floodplains

As defined by Executive Order 11988, *Floodplain Management*, a floodplain is the lowland area adjacent to a river, lake, or stream that may become inundated during a rare flooding occurrence (FEMA, 2012). FEMA defines the 100-year floodplain as the area that would be inundated by the flood event having a 1% annual chance of flooding. The 500-year floodplain is the area between the 100-year floodplain and the area having a 0.2% annual chance of flooding (FEMA, 2013). Information on floodplains within the study area was obtained from the FEMA FIRMs.

2.6.1 Affected Environment

Based on FEMA's FIRMs, 100-year floodplains have been identified within the study area and are depicted in **Figure 4**. Approximately 290 acres of 100-year floodplains and another 20 acres of 500-year floodplains are located within the study area. These floodplains are primarily located in the eastern portion of the study area, along the Southern Branch of the Elizabeth River, Deep Creek, and the Gilmerton Deep Creek Canal. The width of the floodplain extends continuously from the Gilmerton Deep Creek Canal east to Great Bridge Boulevard (VA Route 190), a distance of approximately three miles. The 100-year and 500-year floodplains also are associated with Newton Creek to the northeast of the I-464 interchange. The floodplain along a tributary to Newton Creek extends into the study area approximately 850 feet and is approximately 250 feet in width. There also are floodplains associated with Goose Creek in the western portion of the study area. The 100-year floodplain associated with a tributary of Goose Creek is located to the southwest of the Bowers Hill interchange and is approximately 2,100 feet long and approximately 900 feet in width within the study area.

These floodplains are generally characterized as having moderate commercial and industrial development, particularly adjacent to the Southern Branch of the Elizabeth River, and moderate residential development west of VA Route 190 and east of the Gilmerton Deep Creek Canal. There is little commercial and industrial development in the floodplains south and west of the Bowers Hill interchange and some residential development in the floodplains north of the Bowers Hill interchange.

2.6.2 Environmental Consequences

The relatively large area of floodplains (approximately 310 total acres) identified in the study area reflects the 1,200-foot study corridor across the Southern Branch of the Elizabeth River and Deep Creek. The width of the study area across the river is wider than would be included in the estimated impacts. **Table 5** presents the 100-year and 500-year estimated floodplain impacts by alternative.

Table 5: Total Estimated Floodplain Impacts by Alternative

Alternative	No Build	8 95	8 135	10 95	10 135	Floodplain Acreage within the Study Area
Estimated 100-year Floodplain Impacts (acres)	0.00	30.10	25.98	36.69	31.56	289.83
Estimated 500-year Floodplain Impacts (acres)	0.00	3.79	3.75	4.52	4.49	20.16

Under the No Build Alternative, there would be no floodplain impacts as a result of interstate improvements within the study area. The estimated floodplain impacts from the Build Alternatives would result from roadway fill impacts within the floodplains and from the placement of piers and abutments under the proposed bridges; the assumptions are discussed in **Section 2.2.2**. The estimated permanent impacts to floodplains beneath the bridges would result from the area of the piers, which is assumed to be 20 feet in width and extend the width of the bridge superstructure. As a result, the 135-foot bridge alternatives impact less floodplain area due to more of the bridge being constructed atop piers and less of the bridge being constructed on roadway fill.

If and when the project advances toward design, every effort would be made to avoid or minimize any potential impacts to floodplains. Encroachments resulting from the proposed improvements are not “significant encroachments”, which according to 23 CFR §650.105(q) are defined as one or more of the following flood related impacts:

- Potential interruption of transportation facility needed for emergency vehicles or evacuation route;
- A significant risk; and,
- A significant adverse impact on natural or beneficial floodplain values (United States Government Printing Office (GPO), 2014).

2.7 Water Quality

Early in the planning process, VDOT began coordinating with agencies involved with water quality and drinking water sources found within the study area. Agencies that received scoping letters requesting their comments in regards to natural resources are listed in **Section 1.4**. Additionally, a number of internet databases were explored throughout September and October 2013 to identify water quality and drinking water sources, including databases from EPA, VDH, Chesapeake, and DEQ. Impaired water bodies within the study area were identified in DEQ’s *Final 2012 305(b)/303(d) Water Quality Assessment Integrated Report* (DEQ, 2012).

2.7.1 Affected Environment

In DEQ’s *Final 2012 305(b)/303(d) Water Quality Assessment Integrated Report*, water bodies are rated on their ability to support designated uses of the water by human or aquatic life (DEQ, 2012). Impaired waters are designated as partially supporting or not supporting any of the five designated uses: aquatic life; fish consumption; shellfishing; swimming / recreation; and drinking water. The results of the impairments within several streams and river segments in the vicinity of the study area are included in **Table 6**.

Table 6: Impaired Waters in the Vicinity of the Study Area

Surface Water	Designated Use Impairments				
	Aquatic Life	Fish Consumption	Shellfishing	Recreation	Drinking Water
Goose Creek	NS	NS	N/A	No Data	N/A
Deep Creek	NS	NS	N/A	No Data	N/A
Hodges Creek	NS	NS	N/A	No Data	N/A
Mains Creek	NS	NS	N/A	No Data	N/A
Southern Branch of Elizabeth River-South of I-64	NS	NS	N/A	No Data	N/A
Southern Branch of Elizabeth River-North of I-64	NS	NS	N/A	Supporting	N/A

Note: Data taken from Final 2012 305(b)/303(d) Water Quality Assessment Integrated Report

NS-Not Supporting

N/A-Not Applicable

The surface waters in **Table 6** were listed as Not Supporting (impaired) for Aquatic Life Use because of failure to meet the criteria for concentration of dissolved oxygen established by DEQ (DEQ, 2014a). In addition, VDH issued a fish consumption advisory for polychlorinated biphenyls (PCBs) for all surface waters noted in **Table 6**, and for dioxins in the Southern Branch of the Elizabeth River and its tidal tributaries (except Goose Creek). The table listed shellfishing as Not Applicable as the area has been identified as a Shellfish Condemnation Zone because harvesting is not allowed (DEQ, 2014b).

In 2010, EPA mandated Total Maximum Daily Loads (TMDLs) for all states in the Chesapeake Bay watershed in order to clean up the Chesapeake Bay and achieve water quality standards (EPA, 2010). TMDLs are calculated by adding the individual wasteload allocations for point sources and load allocations for nonpoint sources. In Virginia, the Chesapeake Bay TMDLs were established by DEQ for 92 contributing surface water segments within the Chesapeake Bay watershed, including the Southern Branch of the Elizabeth River.

DEQ, which administers the Exceptional State Waters (Tier III) Program, identifies and protects high quality waters in Virginia for the benefit of future generations by prohibiting new point source discharges within the water body. There are no surface waters in the study area that are categorized as Exceptional State Waters (Tier III). The closest Tier III water body is Lake Drummond located approximately 11.5 miles to the southwest of the study area (DEQ, 2013).

Water Supply

The closest sole source aquifer is the Columbia & Yorktown-Eastover sole source aquifer located approximately 25 miles to the northeast of the study area in Northampton County (EPA, 2008). The primary sources of public water for Chesapeake comes from water purchased from Norfolk and treated at the Lake Gaston Water Treatment Plant, the Northwest River located approximately 13 miles south of the High Rise Bridge, three wells near the Hampton Roads Executive Airport located (approximately 3 miles southwest of the Bowers Hill interchange), and four public groundwater wells located along South Battlefield Boulevard (over 2 miles southeast of the I-464 interchange) (City of Chesapeake, 2012).

VDH responded to a request for information in an email dated August 30, 2013, which stated that there are no groundwater wells within approximately one mile of the study area and no surface water intakes

located within approximately five miles of the study area. VDH also stated that the study area is not within Zone 1 (up to 5 miles into the watershed) or Zone 2 (greater than 5 miles into the watershed) of any public surface water sources.

2.7.2 Environmental Consequences

Water Quality

Under the No Build Alternative, there would be no water quality impacts as a result of interstate improvements within the study area. The facility was constructed prior to the passage of the Clean Water Act and does not include any SWM facilities. Therefore, stormwater would continue to carry roadway generated pollutants into the surrounding water resources. It is reasonable to assume that since the existing facility lacks appropriate SWM controls, the No Build Alternative could inhibit the attainment of TMDL goals for the Elizabeth River and streams within the study area.

The Build Alternatives would generate pollutants during construction and operation. Pollutants may include grease, oil, metals, nutrients, nitrogen, deicing salts, roadside vegetation management chemicals, and suspended solids. Sediment runoff produced during construction would be minimized by the production of and adherence to an approved erosion and sediment control plan. Temporary and permanent SWM measures, including SWM ponds, sediment basins, vegetative controls, and other measures, would be implemented to minimize potential degradation of water quality. These measures would reduce or detain discharge volumes and remove many pollutants. All VDOT projects on state-owned lands must comply with the Virginia Erosion & Sediment Control (ESC) Law and Regulations, the Virginia SWM Law and Regulations, the most current version of the VDOT Annual ESC and SWM Specifications and Standards, and the project-specific ESC and SWM plans. Additionally, the implementation of SWM measures along I-64 should produce notable reductions in pollutant loads targeted by the Chesapeake Bay TMDLs. Therefore, the study would not inhibit the attainment of TMDL goals for the Elizabeth River and streams in the study area. In addition, no Exceptional State Waters (Tier III) are located within the study area and therefore no impacts to these resources would be expected.

As noted in the *Alternatives Development Technical Report* (VDOT, 2014a), the existing facility was constructed prior to the passage of the Clean Water Act, and thus does not have SWM facilities to remove roadway generated pollutants. Should the project move forward into the design phase, the proposed facility would be designed to comply with both federal and state stormwater requirements in place at that time. The inclusion of SWM facilities into the study would substantially improve stormwater runoff quality compared to the existing condition because the existing roadway was constructed without SWM facilities.

Water Supply

Due to the distance to water supply resources, there would be no anticipated impacts to sole source aquifers or public drinking water sources.

3.0 WILDLIFE AND HABITAT

Early in the planning process, VDOT began coordinating with agencies involved with documented wildlife occurrences and general habitats found within the study area. Agencies that received scoping letters requesting their comments in regards to natural resources are listed in **Section 1.4**. Scoping responses from the agencies served as a guideline for further work. Throughout September and October

2013, a number of internet databases were explored in an effort to identify protected and critical habitat areas; these included the USFWS Information, Planning, and Conservation (IPaC) system (USFWS, 2013B), the DGIF Virginia Fish and Wildlife Information Service (VaFWIS) database (DGIF, 2013), and the DCR-NHP database for the three subwatersheds that comprise the study area (DCR, 2013B). This work was followed by further agency coordination, reviews of mapping resources, and site reconnaissance.

3.1 Affected Environment

The study area encompasses both aquatic and terrestrial habitats in a suburban/urban mix of residential, commercial, and industrial land uses along I-64.

3.1.1 Terrestrial Wildlife and Habitat

Terrestrial wildlife within the study area include common mammals such as squirrels, rabbits, raccoons, groundhogs, and foxes; birds such as song birds, waterfowl and shore birds; and various reptiles and amphibians (DGIF, 2013). Habitat within the study area is limited by the range of developed land uses along and adjacent to the existing roadways and the maintenance of the interstate right-of-way. Industrial development is located along the east bank of the Southern Branch of the Elizabeth River and in the northwestern portion of the study area. Residential development is located to the northeast of the study area and in the central and eastern portions of the study area. Other than wetlands, which are addressed previously, forests are the primary wildlife habitat within the study area. Despite the relatively high level of development through the corridor, several forested areas are located within the interchanges. Given their location within an interstate facility, these areas provide limited habitat value. The sections below include discussions on these forested areas, as well as invasive species, conservation sites, and the results of searches for the presence of the bald eagles.

Forested Areas

In order to evaluate the potential impacts to large forested habitat tracts, forested areas within and immediately adjacent to the study area were identified and mapped (**Figure 5**). The forested areas were identified from aerial photography and classified as deciduous, evergreen, and mixed. Forested areas primarily characterized by evergreen trees make up approximately 110 total acres, predominately located within the eastern portion of the study area and near the High Rise Bridge. Forested areas characterized by deciduous trees are located generally in the central portion of the study area and near the High Rise Bridge and cover approximately 120 acres. The remaining 273 acres of forested areas are characterized by mixed evergreen and deciduous trees with large tracts in the central and western portions of the study area and several smaller tracts in the eastern portion.

In a letter dated September 18, 2013, DOF recommended avoidance of two forested areas due to their recreational benefits and presumed water quality benefits. The first forested area is located partially within the northwestern portion of the study area, southeast of the Bowers Hill interchange. The second forested area is located west of the High Rise Bridge and north of I-64 (**Figure 5**). Small portions of these forested areas are located within the study area. These forested areas may provide cover for wildlife for activities such as foraging for food and water, nest sites, and roosting in an urban environment along an existing interstate transportation corridor. Correspondence with the agencies is included in **Appendix A** of this Technical Report.

Invasive Species

The study area is located along an interstate highway near urbanized areas where invasive plant species are relatively common. The following highly invasive species, as listed by DCR (2009), were observed during field visits in October and November 2013: Chinese privet (*Ligustrum sinense*), Japanese honeysuckle (*Lonicera japonica*), Japanese stilt grass (*Microstegium vimineum*), multiflora rose (*Rosa multiflora*), and common reed (*Phragmites australis*).

Conservation Sites

Conservation sites are areas containing one or more rare plant, animal, or natural community and buffers or other adjacent land thought necessary for the conservation of the resource. In a letter dated September 20, 2013, DCR-NHP stated that the Great Dismal Swamp Conservation Site is located in the vicinity of the study area. DCR-NHP also stated that there are no State Natural Area Preserves under DCR-NHP's jurisdiction in the vicinity of the study area. Correspondence with the agencies is included in **Appendix A** of this Technical Report.

The closest portion of the Great Dismal Swamp National Wildlife Refuge is located approximately one mile to the south of the Route 13 interchange. Conservation sites are given a biodiversity significance ranking (1-5, 1 being most significant) based on the rarity, quality, and number of element occurrences they contain. The Great Dismal Swamp Conservation Site has been ranked as B2, which indicates it is of very high significance.

Bald Eagle

Since 2007, the bald eagle (*Haliaeetus leucocephalus*) is no longer protected under the Endangered Species Act after removal from the federal threatened and endangered species list. Bald eagles are protected under the Bald and Golden Eagle Protection Act which prohibits taking or disturbing bald eagles and their nests. DGIF and USFWS are responsible for the conservation and management of the bald eagle throughout Virginia. A September 2013 search of the VaFWIS online database indicated that the study area is not within two-miles of a known bald eagle concentration area or roost. However, three bald eagle nesting areas were denoted approximately one mile north of the Bowers Hill interchange. The nest that was most recently active was listed as active on April 25, 2011 (DGIF, 2013). As part of the USFWS IPaC system project review, bald eagle nests and concentration areas were searched in the vicinity of the study area. Two bald eagle nests were identified approximately one mile to the north of the Bowers Hill interchange (Center for Conservation Biology (CCB), 2013A). The closest bald eagle concentration areas were located approximately 15 miles to the northwest of the Bowers Hill interchange (USFWS, 2014A). The results of the VaFWIS search are included in **Appendix E** of this Technical Report. The results of the USFWS search are included in **Appendix F** of this Technical Report.

Aquatic Wildlife and Habitat

Major aquatic resources within the study area include the Southern Branch of the Elizabeth River, Deep Creek, and the Gilmerton Deep Creek Canal. Both tidal and non-tidal waters are located within this area. A variety of aquatic species, including bivalves, fish, reptiles, amphibians, and aquatic birds reside in these surface water habitats for temporary and/or permanent habitat (DGIF, 2013). The Elizabeth River and all of its tributaries within the study area are listed by DEQ as impaired for aquatic life due to failure to meet dissolved oxygen criteria and for fish consumption due to polychlorinated biphenyls PCBs in fish tissue.

Anadromous Fish

Anadromous fish are fish that live in saltwater but return to freshwater to spawn (DGIF, 2014). Anadromous fish use areas are identified by DGIF as streams and rivers that have been used or have the potential to be used as migration pathways, spawning grounds, or nursery areas for anadromous fish. Confirmed anadromous fish use areas are those waters where anadromous fish species have been observed and are known to exist. The Southern Branch of the Elizabeth River, in proximity to the High Rise Bridge, is listed as an anadromous fish waters (DGIF, 2013). Although DGIF depicts the anadromous fish reach to terminate several hundred feet to the north of the High Rise Bridge, it would be possible that anadromous fish would be located within the area of the bridge. The VaFWIS anadromous fish use report lists the yellow perch (*Perca flavescens*) as the only confirmed anadromous species within this reach of the Elizabeth River. The yellow perch is not listed as threatened or endangered. The results of the VaFWIS search are included in **Appendix E** of this Technical Report.

3.2 Environmental Consequences

3.2.1 Terrestrial Wildlife and Habitat

Anticipated impacts to common terrestrial wildlife within the study area would be minimal as the study area is an existing roadway facility and there is ample habitat in the surrounding residential and commercial areas. Potential impacts to threatened and endangered species are included in **Section 4.0**.

Forested Areas

Under the No Build Alternative, there would be no impacts to forested areas as a result of interstate improvements within the study area. Permanent impacts to forest resources from each of the Build Alternatives would consist of conversion of forested land to either pavement or maintained herbaceous or shrub land. A total of approximately 503 acres of forested land is located within the study area. **Table 7** presents the estimated forested areas impacts for each alternative.

Table 7: Estimated Forested Areas Impacts by Build Alternative

Alternative	No Build	8 95	8 135	10 95	10 135	Total Forested Area in the Study Area
Estimated Deciduous Forested Areas Impacts (acres)	0.00	71.42	71.16	71.14	70.84	119.88
Estimated Evergreen Forested Areas Impacts (acres)	0.00	49.78	46.27	51.43	47.11	110.41
Estimated Mixed Forested Areas Impacts (acres)	0.00	151.33	151.33	156.02	156.04	273.14
Total Estimated Forested Areas Impacts (acres)	0.00	272.52	268.75	278.59	273.98	503.43

No impacts would be anticipated for the two forest resources for which DOF recommended avoidance. According to DOF, “Extensive coordination with the different agencies should continue throughout all stages of project development to reduce potential impacts to these resources. In addition, avoidance and minimization of potential impacts to the natural environment and wildlife should be considered throughout the design and construction phases of the project. Permitting of the project would also address avoidance, minimization, and compensatory mitigation measures, as needed”. Correspondence with the agencies is included in **Appendix A** of this Technical Report.

Impacts to forested areas characterized with evergreen trees would occur from any of the Build Alternatives primarily in the I-464 interchange, impacts to forested areas characterized with deciduous trees would occur primarily in the Route 13 and Route 17 interchanges, and impacts to mixed forested areas would occur mainly in the Bowers Hill and Route 13 interchanges. For the purposes of this study, a worst case scenario is presented and all forested areas within interchanges are assumed to be impacted. Future forested areas impacts would be reduced if practicable based on further traffic and engineering studies. Although clearing of forested areas would include the displacement of wildlife and impact habitat, these areas generally provide limited value as they are located within an interstate facility. Most of these forested areas are isolated by the interstate and other roadways in these urban and residential areas, therefore, impacts to the movement of terrestrial wildlife through these forested areas is expected to be minimal. If and when the project moves forward into design, impacts to the forest resources would be avoided and minimized to the greatest extent practicable.

Invasive Species

Any of the alternatives under consideration could increase the spread of invasive species, particularly those species noted in **Section 3.1**. The removal and transfer of fill from barrow sites within the limits of disturbance or offsite locations could spread invasive species. The spread of invasive species would be minimized by following provisions in VDOT's Road and Bridge Specifications. These provisions require prompt seeding of disturbed areas with mixes that are tested in accordance with the Virginia Seed Law and VDOT's standards and specifications to ensure that seed mixes are free of noxious species. While the study area would be vulnerable to the colonization of invasive plant species from adjacent properties, implementation of the stated provisions would reduce the potential for the establishment and proliferation of invasive species.

Conservation Sites

There are no anticipated impacts to the Great Dismal Swamp National Wildlife Refuge due to its distance from the study area.

Bald Eagle

According to guidance from USFWS, if the action area is not within 660 feet of a bald eagle nest, than disturbance to nesting bald eagles is unlikely (USFWS, 2013B). Since bald eagle nests are located over 660 feet from the study area, it is anticipated that there would be no effects to nesting bald eagles. Also, since bald eagle roosts and concentration areas are not within the vicinity of the study area, no impacts to bald eagles would be anticipated to occur.

Aquatic Wildlife and Habitat

Anticipated impacts to common aquatic wildlife within the study area would be minimal as the study area is an existing roadway facility and there is ample habitat in the surrounding areas. Estimated impacts to streams are discussed in **Section 2.2** and water quality issues are discussed in **Section 2.7** of this document. Potential impacts to threatened and endangered species are included in **Section 4.0**. Impacts to anadromous fish are discussed below.

Anadromous Fish

Although there are no anticipated impacts to anadromous fish, continued coordination with the appropriate agencies would occur in order to reduce potential impacts to these resources. At the time of

permitting, potential construction phase impacts would be addressed through time of year restrictions and/or special conditions that would reduce the likelihood of impacts to anadromous fish.

4.0 THREATENED AND ENDANGERED SPECIES

Early in the planning process, VDOT began coordinating with agencies involved with federal and state listed threatened and endangered species. Agencies that received scoping letters requesting their comments in regards to natural resources are listed in **Section 1.4**. Scoping responses from the agencies served as a guideline for further work. Throughout September and October 2013, a number of internet databases were explored in an effort to identify supplementary federal and state listed species; these include the USFWS IPaC system (USFWS, 2013B and 2014A), the DGIF VaFWIS database (DGIF, 2013), and the DCR-NHP database for the three subwatersheds that comprise the study area (DCR, 2013B).

Table 8 depicts the threatened and endangered species that can be found within two miles of the study area according to the database searches conducted. In addition, descriptions of the listed threatened and endangered species and their habitat requirements are provided below.

Table 8: Threatened and Endangered Species within Two Miles of the Study Area

Common Name	Scientific Name	Status
canebreak rattlesnake	<i>Crotalus horridus</i>	State Endangered (SE)
Dismal Swamp southeastern shrew	<i>Sorex longirostris fisheri</i>	State Threatened (ST)
peregrine falcon	<i>Falco peregrinus</i>	State Threatened (ST)

In addition to the above listed species identified in the database searches, there are two additional species that are included in this report: the federally listed Atlantic sturgeon (*Acipenser oxyrinchus*) and northern long-eared bat (*Myotis septentrionalis*). Sturgeons occur in tidal waters and lower reaches of non-tidal tributaries in coastal Virginia. Although the portion of the Southern Branch of the Elizabeth River that is contained within the study area is not known to be suitable habitat for the sturgeon, it is possible that the species could move through the area.

Although it is not presently a federally listed species, the northern long-eared bat was proposed for federal listing on October, 2013 as endangered under the Endangered Species Act. A final decision to list the species is expected by April, 2015. As a result, a discussion of the northern long-eared bat is included in this document.

According to DCR-NHP, impacts to documented state listed threatened and endangered plants or insects would not be anticipated. In addition, there were no listed plants or insects identified within the study area in any databases that were searched.

4.1 Endangered Species

4.1.1 Affected Environment

According to the USFWS IPaC system, no federally-listed threatened or endangered species occur in the study area (USFWS, 2013B). However, the VaFWIS database denoted one state listed endangered species within two miles of the study area, the canebrake rattlesnake (*Crotalus horridus*) (DGIF, 2013). The DCR-NHP database also identifies the canebrake rattlesnake as existing within the subwatersheds (DCR, 2013B). The results of the USFWS search are included in **Appendix F** of this Technical Report. The results of the VaFWIS search are included in **Appendix E** of this Technical Report. The results of the DCR-NHP subwatershed search are included in **Appendix G** of this Technical Report.

Canebrake rattlesnake (Crotalus horridus)

According to NatureServe (2013) the conservation status of the Coastal Plain population of the canebrake rattlesnake in Virginia is S1--critically imperiled. Their diet is largely made up of the grey squirrel (*Sciurus carolinensis*) and other small rodents and birds. The canebrake rattlesnake population is listed as state endangered. The population of this species is declining primarily due to habitat loss. According to DGIF's Canebrake Rattlesnake Conservation Plan (DGIF, 2011), the average habitat area required by this species ranges from approximately 45 acres for females to over 200 acres for males.

Preferred habitat of the canebrake rattlesnake includes mature hardwood and mixed hardwood-pine forests, forested cane thickets, and ridges adjacent to swampy areas (DGIF, 2011). Canebrake rattlesnakes were not confirmed by DGIF to be located within the study area, but were confirmed to be located in several areas approximately 3,000 feet to the west of the Bowers Hill interchange, as shown on **Figure 6**.

Predicted habitat for the canebrake rattlesnake was identified within the study area (DGIF, 2013). Mature hardwood and hardwood-pine forests occur within the study area, particularly within the Bowers Hill interchange, the Route 13 interchange, and within and adjacent to the I-64 mainline in the western portion of the study area. Therefore, a search was performed for large, contiguous forested areas that could provide potential canebrake rattlesnake habitat within the study area.

Three large forested areas were identified. The first forested area is approximately 45 acres and bound to the west by the Bowers Hill interchange, to the south by I-64 and Grand Isle Drive, and to the north by I-264. The second forested area is 71 acres, and is characterized by both mature deciduous and mixed forested areas located southeast of the Route 13 interchange and north of a large industrial complex. The third forested area is approximately 37 acres and characterized by mixed mature trees identified north of I-64 and west of the Route 17 interchange and south and east of a power substation. According to DGIF's Canebrake Rattlesnake Conservation Plan (DGIF, 2011), the average habitat area required by this species ranges from approximately 45 to over 200 acres. Highways are a direct source of canebrake rattlesnake mortality and the rattlesnake habitats are effectively fragmented by highways (DGIF, 2011). Therefore, despite the presence of large forested areas, it is unlikely that canebrake rattlesnakes would be located in the median or in an interchange cloverleaf of the study area.

Atlantic sturgeon (Acipenser oxyrinchus)

In 2012, the Atlantic sturgeon was listed as federal endangered and also is listed as state endangered. Three databases were searched for threatened and endangered species, including the Atlantic sturgeon, in the vicinity of the study area. No federally-listed species were identified in the study area according to

the USFWS IPaC system (USFWS, 2013B). Although a search of the VaFWIS database, maintained by DGIF, listed the Atlantic sturgeon in the Biota of Virginia database, the sturgeon is not listed as confirmed in the Species Observation database within two-miles of the study area. The closest reach of the Elizabeth River where the Atlantic sturgeon is listed in the Species Observation database is approximately six miles to the north of the study area, near the confluence of the Western Branch of the Elizabeth River and the Elizabeth River. The sturgeon has not been observed in the Southern Branch of the Elizabeth River or the Eastern Branch of the Elizabeth River, but has been located approximately 5 ½ miles north of the study area, according to the VaFWIS database (DGIF, 2013). Also, the DCR-NHP database was searched for the three subwatersheds that comprise the study area and the Atlantic sturgeon was not listed as present in any of the three subwatersheds (DCR, 2013B).

The Atlantic sturgeon is an anadromous fish that spends most of its life in salt water near the Chesapeake Bay in this area of the mid-Atlantic, and spawns in freshwater (USFWS, 2014B). The Atlantic sturgeon has been documented to spawn near Richmond, Virginia in the James River (Balazik, 2012). Spawning occurs in deep parts of large rivers with cold, clean water on a hard surface substrate such as cobbles and bedrock to which their highly adhesive eggs can attach (National Atmospheric and Atmospheric Administration (NOAA), 2014). Since the Southern Branch of the Elizabeth River in the vicinity of the study area is characterized by brackish waters with sandy substrates, spawning by Atlantic sturgeon would be unlikely. However, it may be possible that transient individuals could be found in the Southern Branch of the Elizabeth River.

Northern long-eared bat (*Myotis septentrionalis*)

According to USFWS, the northern long-eared bat may be located in the vicinity of the study area (USFWS, 2014A). However, there were no records of the northern long-eared bat within the study area (DGIF, 2013; DCR, 2013B). The northern long-eared bat's range covers the eastern United States, including Virginia. It hibernates between mid-fall through spring in underground caves, mines and cave-like structures. Summer habitat ranges from mid-May through mid-August and includes a wide variety of forested/wooded habitat with varying canopy closure. Suitable roosting trees are typically greater than three inches in diameter at breast height and can be both living or dead having cracks, crevices and peeling bark (USFWS, 2014C). The northern long-eared bat has also been documented to roost in man-made structures such as bridges in the summer between Mid-May and mid-August (USFWS, 2014D).

As discussed in **Section 3.1**, there are a total of approximately 503 acres of forested areas within the study area. Evergreen forested areas make up approximately 110 total acres, primarily within the eastern portion of the study area and near the High Rise Bridge. Deciduous forested areas are located generally in the central portion of the study area and near the High Rise Bridge and cover approximately 120 acres. The remaining approximately 273 forested acres are characterized by mixed evergreen and deciduous trees with large tracts in the central and western portions of the study area and several smaller tracts in the eastern portion. These forested areas may provide suitable summer habitat for the northern long-eared bat.

4.1.2 Environmental Consequences

Canebrake rattlesnake (*Crotalus horridus*)

Although the canebrake rattlesnake is unlikely to exist within the study area, impacts to potential forested habitats would be limited. Under any of the proposed alternatives, a relatively small portion of the 37-acre forested property identified north of I-64 and west of the Route 17 interchange would be potentially

impacted. Also, impacts are not anticipated to the northern portion of the off ramp of I-64 to I-264 adjacent to the 45-acre forested area located east of the Bowers Hill interchange.

Atlantic sturgeon (Acipenser oxyrinchus)

In order to evaluate the potential impact of construction activities, such as pile driving, on sturgeon, a biological opinion document was reviewed that was prepared for the replacement of the Richmond-Dresden Bridge on Route 197 in Maine for the Maine Department of Transportation (NOAA, 2012). The study was conducted by NMFS for FHWA in 2012 for a new 1,400-foot long bridge. Potential impacts to the Atlantic sturgeon and the shortnose sturgeon (*Acipenser brevirostrum*) were evaluated. It was anticipated that no effects on the sturgeon would occur from a vibratory hammer while installing piles. However, this study found the use of an impact hammer during pile driving or installation of coffer dams would generate sufficient sound under water to cause changes in behavior (i.e. swimming away from construction zone) if sturgeon were present. Effects from a hoe ram used during demolition of existing piers was not expected to cause behavior modification (such as swimming away) at a distance of 200 feet or more from the source.

Given that Atlantic sturgeon are not documented within the study area and are not known to breed in the study area, impacts to the Atlantic sturgeon would not be anticipated. Although it is possible that transient individuals could be located within the study area, it would be anticipated that sounds produced by the project would cause the sturgeon to avoid the construction activities. Mitigation measures such as employing cushions and blocks during impact hammer usage, daily work limits, bubble curtains, and being vigilant for sturgeon entrapment in cofferdams with immediate release of individuals, would reduce potential impacts from this project to the Atlantic sturgeon.

Northern long-eared bat (Myotis septentrionalis)

The northern long-eared bat prefers to roost in the summer in caves or mines, underneath the bark of trees or in cavities or crevices in live or dead trees. Since there are approximately 503 acres of a wide variety of forested/wooded habitat within the study area, it is possible that summer populations of the northern long-eared bat could be supported. Direct impacts to the northern long-eared bat populations could be avoided by delaying any clearing of forested areas until late fall or winter when the bats are hibernating outside of the study area in mines and caves. Construction activities may mitigate for potential roosting bats in bridges by excluding bats from the structure by allowing the bats to exit, but not re-enter the roost areas, educating construction workers about how to identify and avoid disturbances to bats where practicable, and potential time of year restrictions to avoid construction on bridges during the summer roosting months (Keeley and Tuttle, 1999).

4.2 Threatened Species

4.2.1 Affected Environment

The VaFWIS database denoted the following state listed threatened species within two miles of the study area: the Dismal Swamp southeastern shrew (*Sorex longirostris fisheri*) and the peregrine falcon (*Falco peregrinus*) (DGIF, 2013). The DCR-NHP database was searched for the three subwatersheds that comprise the study area (DCR, 2013B). The database results identified the same two state listed threatened species as the VaFWIS database, the Dismal Swamp southeastern shrew and the peregrine falcon. The results of the VaFWIS search are included in **Appendix E** of this Technical Report. The results of the DCR-NHP subwatershed search are included in **Appendix G** of this Technical Report.

Dismal Swamp southeastern shrew (Sorex longirostris fisheri)

According to NatureServe (2013) the Dismal Swamp southeastern shrew is a habitat generalist that feeds on small invertebrates. The shrew is often found in habitats of the Great Dismal Swamp that are not permanently flooded such as areas with ground litter and moist organic soils in early to mid-successional forest, old clearcuts, and areas with thick undergrowth. In a letter dated September 20, 2013, DCR-NHP stated that early successional stage forests with dense understories support the largest numbers of Dismal Swamp southeastern shrews. Threats to this species primarily include habitat loss resulting from wetland drainage and land development.

According to the VaFWIS website (DGIF, 2013), there are two records of the Dismal Swamp southeastern shrew being observed to the west of the study area, as shown on **Figure 6**.

Predicted habitat is generally located south of Route 13 near the western portion of the study area and south of I-64 generally from Route 17 west-northwest to the railroad tracks south of Yadkin Road. DCR-NHP recommended a habitat assessment for the Dismal Swamp southeastern shrew in a 0.5 mile section from 0.25 mile north to 0.25 mile south of the junction of I-64 and Route 13 and in the powerline and adjacent wetlands approximately one mile to the west (**Figure 6**). The powerline and adjacent wetland area were field reviewed in November 2013. The powerline area was cleared, mowed and maintained adjacent to existing industrial use areas. The wetland had been cleared, grubbed, graded, grassed, and mowed. Therefore, the powerline and wetland area is not suitable Dismal Swamp southeastern shrew habitat.

Peregrine falcon (Falco peregrinus)

According to the CCB, peregrine falcons breeding in Virginia are centered on the Coastal Plain (CCB, 2013B). According to VDOT records, there is a peregrine falcon nest box on the High Rise Bridge that was occupied with two adults and active with young in the nest in March 2014. The chicks were to be released in Shenandoah National Park when the chicks are old enough to leave the nest.

4.2.2 Environmental Consequences

Dismal Swamp southeastern shrew

There are no known records of the Dismal Swamp southeastern shrew within the study area. The majority of the vegetation within the study area is either maintained grass or mature forest, neither which are likely habitat for the Dismal Swamp southeastern shrew. In addition, the field-reviewed powerline and adjacent wetland area identified by DCR-NHP as potential habitat was determined not to be likely habitat. Therefore, impacts to the Dismal Swamp southeastern shrew are not anticipated.

Peregrine falcon

An active peregrine falcon nest box exists on the High Rise Bridge. The nest site may continue to be utilized until such time as the existing bridge is removed and/or a new nest site is located on the new bridge and/or alternative nesting structures such as platforms are provided. VDOT would coordinate with all appropriate agencies if and when the study advanced to design and construction, and schedule removal of the existing nest box outside of the breeding/nesting season, and the installation of nest boxes on new bridges during the appropriate time of year so as to not disturb the nesting activities and breeding season which would minimize impacts to the peregrine falcon.

As no federally listed threatened and endangered plant or animal species were confirmed to exist within the study area, none of the proposed alternatives would be expected to affect federally listed threatened and endangered species. VDOT cooperates with state authorities in an effort to identify and conserve state listed species whenever feasible. With the incorporation of best management practices, impacts to rare, threatened and endangered species that may be located in the vicinity of the study area would be avoided to the greatest extent practicable. A more detailed assessment of impacts and minimization efforts would be performed during final design, once an alternative has been selected.

- I 64/High Rise Bridge
Corridor Study Area*

Water Bodies

Great Dismal Swamp
- Floodplains in Study Area**

100 Year Floodplain, 290 acres

500 Year Floodplain, 20 acres

**The study area is a buffer around the road corridor that includes all natural, cultural and physical resources that must be analyzed in the NEPA document. It does not imply right-of-way take or construction impact.*

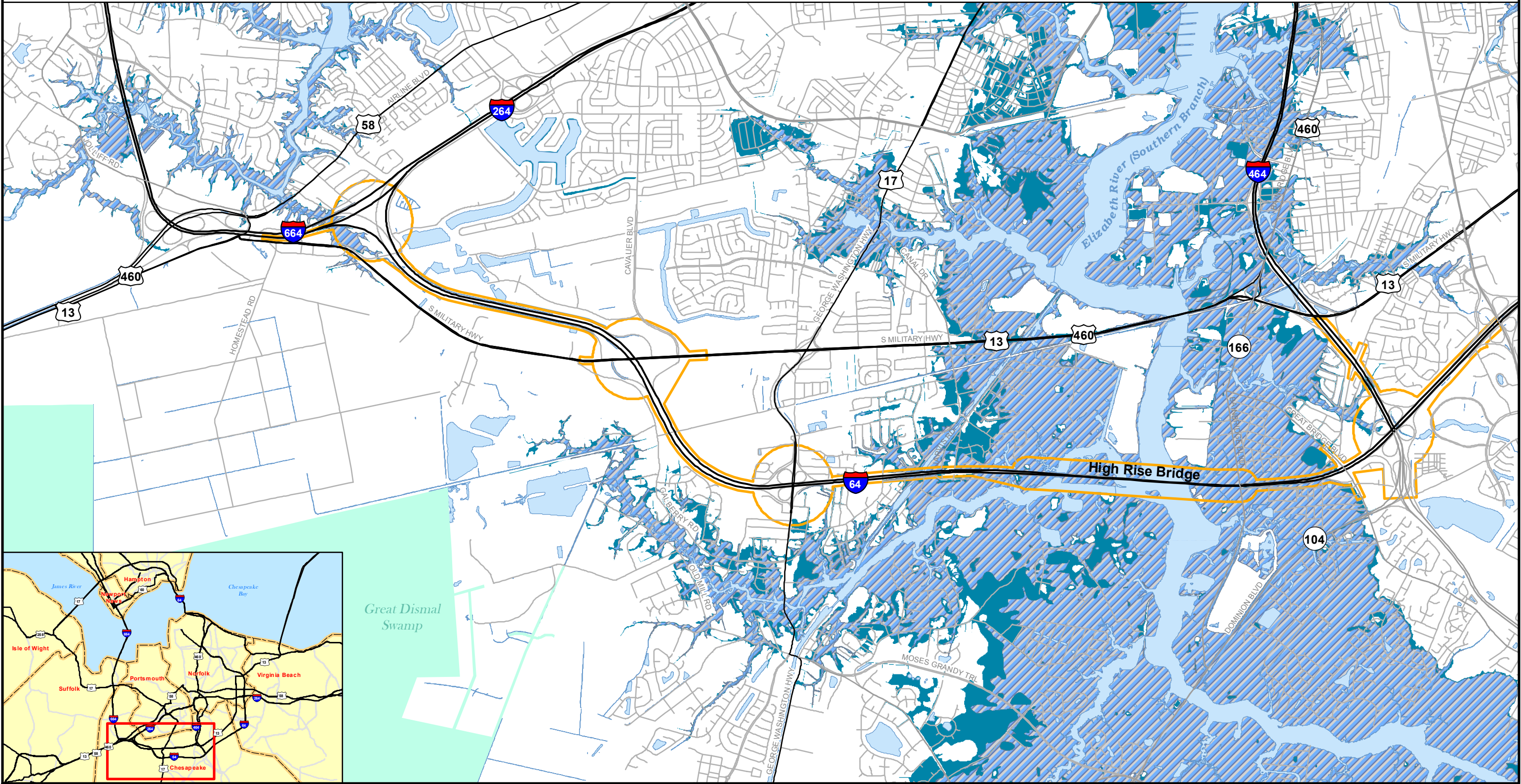
Mapping Source: VDOT and City of Chesapeake

Figure 4 Floodplains

Interstate 64/High Rise Bridge Corridor Study
Natural Resources Technical Report

City of Chesapeake

State Project Number: 0064-131-783, P101; UPC: 104366
Federal Project Number: NH-IM-064-3(481)



- I 64/High Rise Bridge
Corridor Study Area*

Water Bodies

Great Dismal Swamp
- Streams in Study Area

Field Verified Non-Tidal Stream: 11,639'

Field Verified Tidal Stream: 101.13 acres

Other Stream

Watershed Sub-basin Boundary

*The study area is a buffer around the road corridor that includes all natural, cultural and physical resources that must be analyzed in the NEPA document. It does not imply right-of-way take or construction impact.

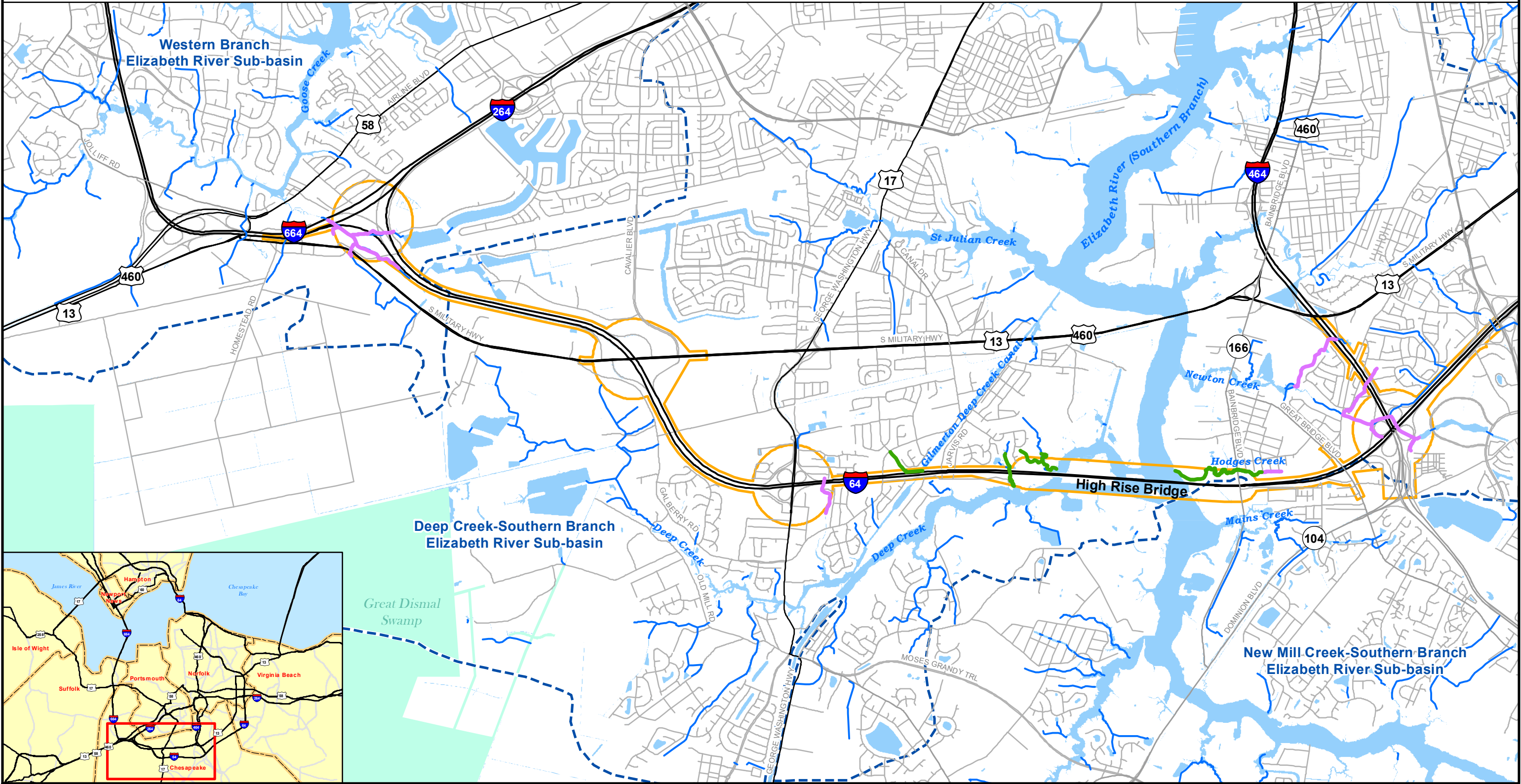
Mapping Source: VDOT, City of Chesapeake, VA and the U.S. Geological Survey

Figure 2 Water Bodies

Interstate 64/High Rise Bridge Corridor Study
Natural Resources Technical Report

City of Chesapeake

State Project Number: 0064-131-783, P101; UPC: 104366
Federal Project Number: NH-IM-064-3(481)



- I 64/High Rise Bridge Corridor Study Area*
- Water Bodies
- Great Dismal Swamp

- Wetlands in Study Area**
- E2EM, 42.54 acres
 - PEM, 4.75 acres
 - PFO, 44.07 acres

State Project Number: 0064-131-783, P101; UPC: 104366
Federal Project Number: NH-IM-064-3(481)



*The study area is a buffer around the road corridor that includes all natural, cultural and physical resources that must be analyzed in the NEPA document. It does not imply right-of-way take or construction impact.

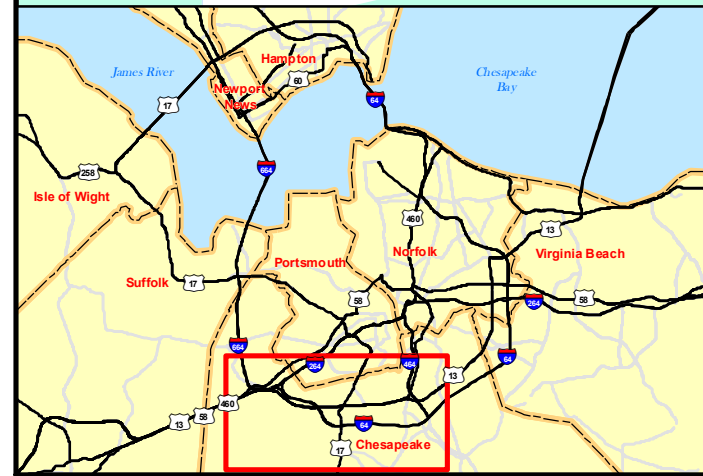
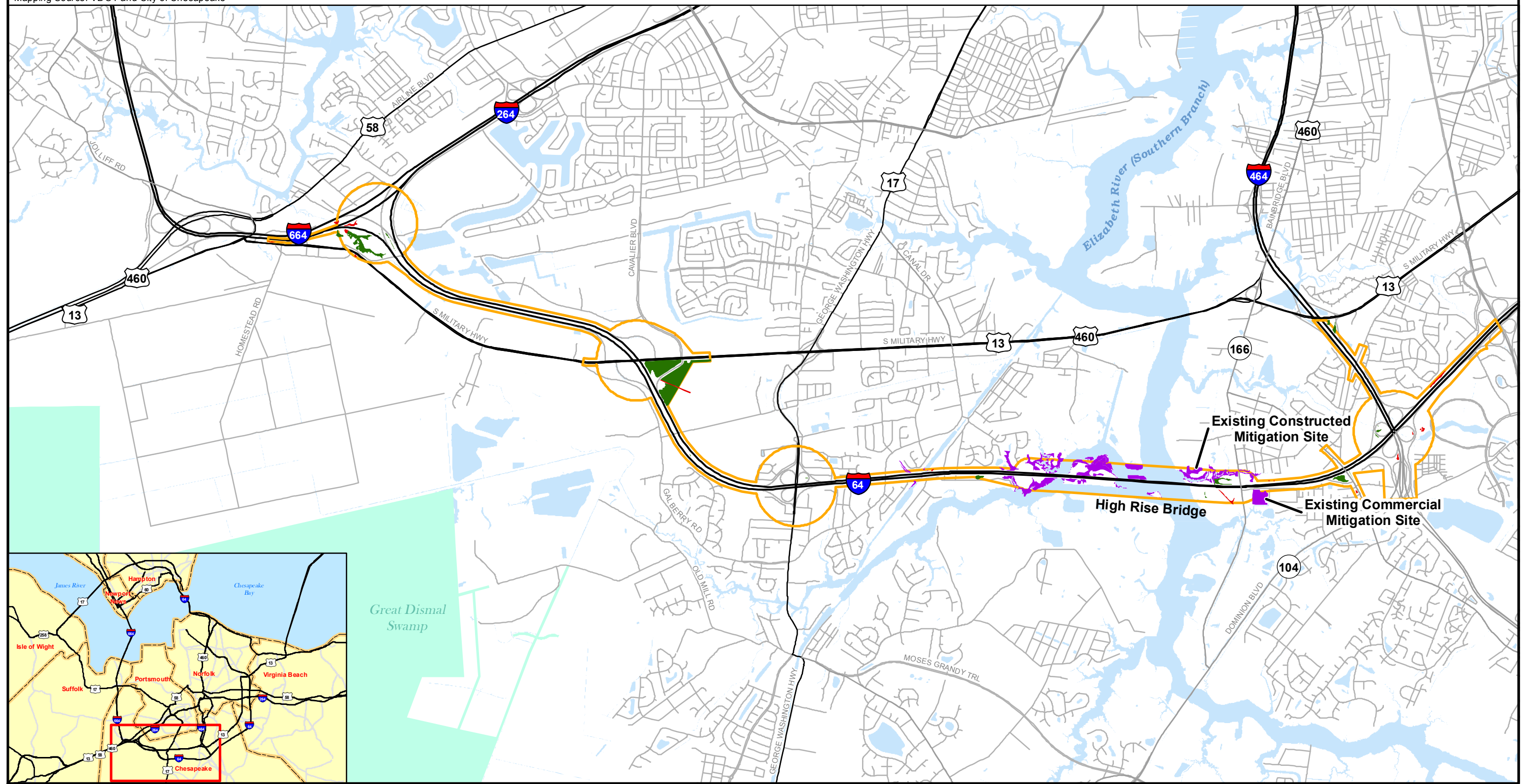
Mapping Source: VDOT and City of Chesapeake

Figure 3 Wetlands

Interstate 64/High Rise Bridge Corridor Study

Natural Resources Technical Report

City of Chesapeake



- I 64/High Rise Bridge
Corridor Study Area*
- Water Bodies
- Great Dismal Swamp
- Forested Area in Study Area

Deciduous, 120 acres

Evergreen, 110 acres

Mixed, 273 acres

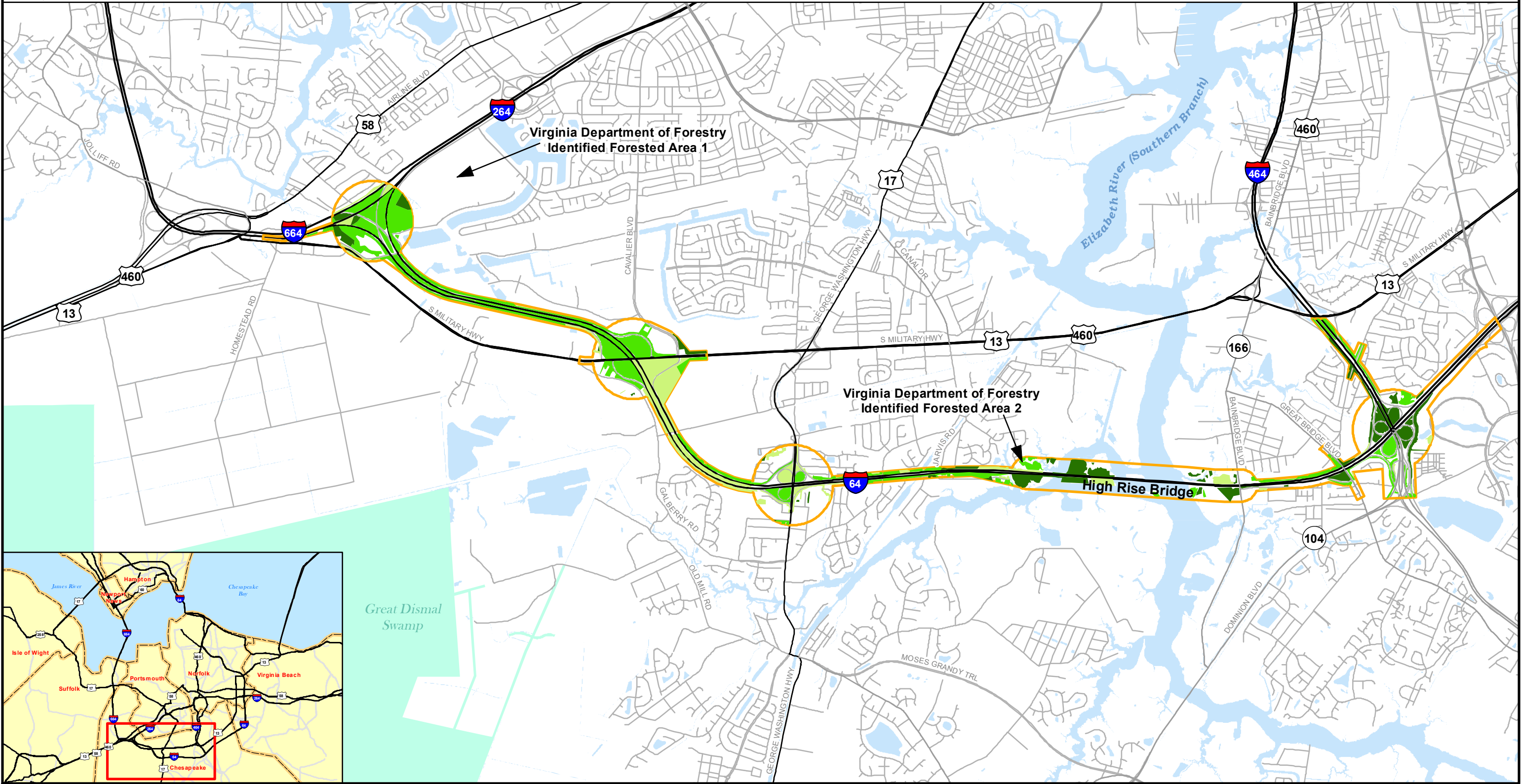
*The study area is a buffer around the road corridor that includes all natural, cultural and physical resources that must be analyzed in the NEPA document. It does not imply right-of-way take or construction impact.

Mapping Source: VDOT and City of Chesapeake

Figure 5 Forested Areas

Interstate 64/High Rise Bridge Corridor Study
Natural Resources Technical Report
City of Chesapeake

State Project Number: 0064-131-783, P101; UPC: 104366
Federal Project Number: NH-IM-064-3(481)



- I 64/High Rise Bridge Corridor Study Area*
- Water Bodies
- Great Dismal Swamp

- Species Observations**
- Bald Eagle
 - Peregrine Falcon
 - Canebrake Rattlesnake
 - Dismal Swamp Southeastern Shrew
 - Potential Dismal Swamp Southeastern Shrew Habitat

*The study area is a buffer around the road corridor that includes all natural, cultural and physical resources that must be analyzed in the NEPA document. It does not imply right-of-way take or construction impact.

Mapping Source: VDOT and City of Chesapeake

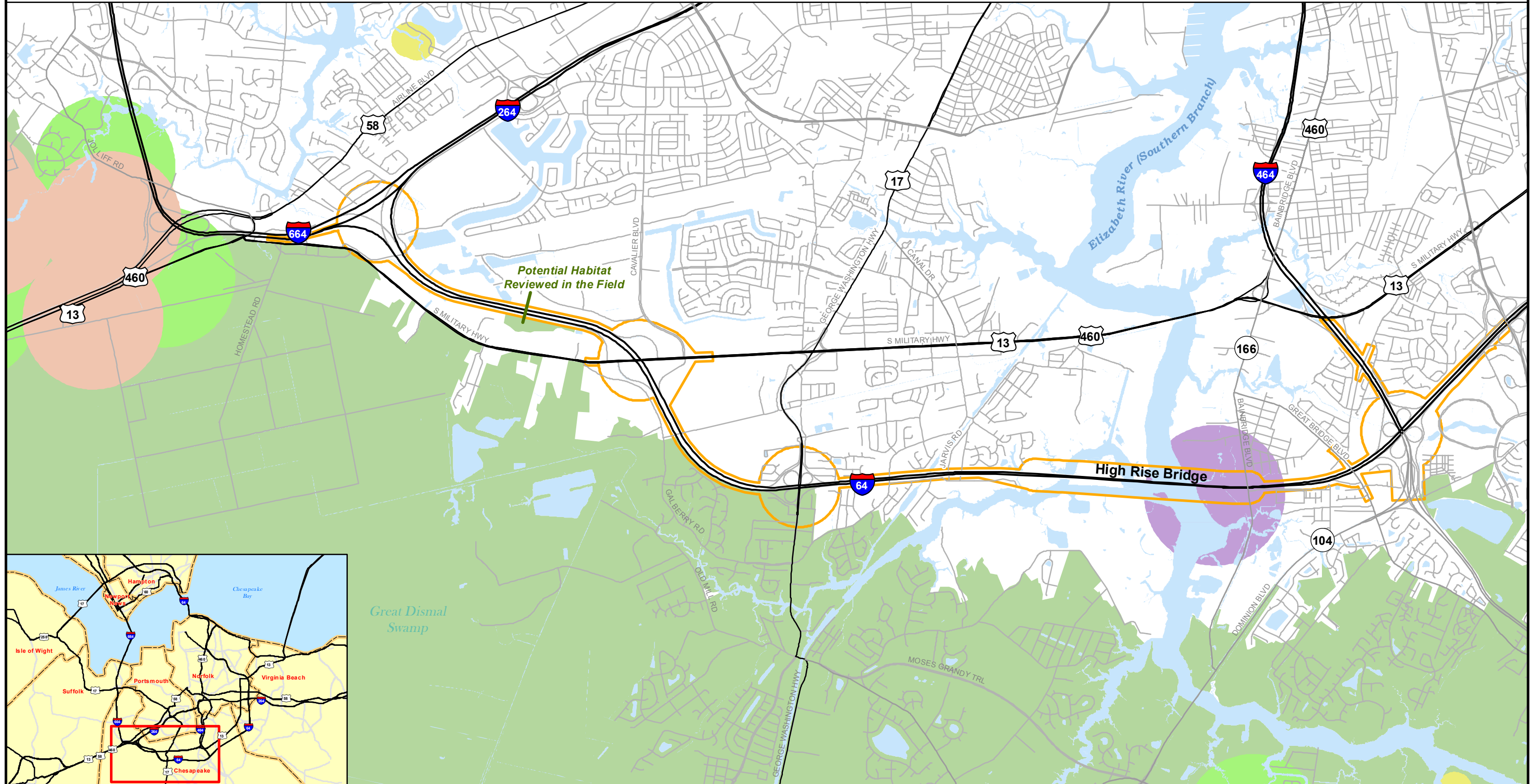
Figure 6 Threatened and Endangered Species

Interstate 64/High Rise Bridge Corridor Study Natural Resources Technical Report City of Chesapeake

State Project Number: 0064-131-783, P101; UPC: 104366
Federal Project Number: NH-IM-064-3(481)



0 0.25 0.5 1 1.5 Miles



5.0 REFERENCES

- Balazik, Matthew Thomas (2012, December). *Life History Analysis of James River Atlantic Sturgeon (Acipenser oxyrinchus oxyrinchus) with Implications for Management and Recovery of the Species*, A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy at Virginia Commonwealth University. Retrieved April 3, 2014 from: https://digarchive.library.vcu.edu/bitstream/handle/10156/4090/Balazik_Matthew_PhD.pdf?sequence=1.
- Center for Conservation Biology (CCB) (2013A, September 24). *Guidance: Local Wetlands Board and VMRC Contacts (as of 2/2012)*. Retrieved September 10, 2014 from: http://ccrm.vims.edu/permits_web/guidance/local_wetlands_boards.html
- Center for Coastal Resource Management (CCRM) (2014, September 10), VMRC acts as the Local Wetland Board in Chesapeake (CCRM, 2014)
- CCB (2013B, November 19). *Peregrine Falcon Populations*. Retrieved November 19, 2013 from: <http://www.ccbbirds.org/what-we-do/research/species-of-concern/peregrine-falcon/falcon-populations/>.
- City of Chesapeake (2012). *Department of Public Utilities, Water Quality Report, 2012 Data*. Retrieved November 21, 2013 from: http://www.cityofchesapeake.net/Assets/documents/departments/public_utilities/water_quality/2012data.pdf.
- Cowardin, Lewis M., Carter, V., Golet, F.C., & LaRoe, E.T. (1979). *Classification of Wetlands and Deepwater Habitats of the United States*. Washington, D.C.: U.S. Department of the Interior, Fish and Wildlife Service. Retrieved November 18, 2013 from: <http://www.npwrc.usgs.gov/resource/wetlands/classwet/>.
- Department of Conservation and Recreation (DCR) (2009, September). *Invasive Alien Plant Species of Virginia*. Accessed November 22, 2013 from: http://www.dcr.virginia.gov/natural_heritage/documents/invlist.pdf.
- DCR (2013B, September 24). *Virginia Natural Heritage Database Search of City of Chesapeake subwatersheds*. Accessed September 24, 2013 from: <https://vanhde.org/species-search>.
- DCR (2013A, November 7). *Virginia Scenic Rivers*. Richmond, VA: Department of Conservation and Recreation, Recreation Planning. Retrieved March 28, 2014 from: http://www.dcr.virginia.gov/recreational_planning/documents/srlist.pdf.
- Department of Environmental Quality (DEQ) (2012, March). *Final 2012 305(b)/305(d) Water Quality Assessment Integrated Report*. Richmond, VA: Department of Environmental Quality, Office of Water Monitoring and Assessment. Retrieved April 15, 2014 from: [http://www.deq.state.va.us/Programs/Water/WaterQualityInformationTMDLs/WaterQualityAssessments/2012305\(b\)303\(d\)IntegratedReport.aspx](http://www.deq.state.va.us/Programs/Water/WaterQualityInformationTMDLs/WaterQualityAssessments/2012305(b)303(d)IntegratedReport.aspx).

- DEQ (2013, November 21). *Exceptional State Waters (TierIII)*. Retrieved November 21, 2013 from: [http://www.deq.virginia.gov/Programs/Water/WaterQualityInformationTMDLs/WaterQualityStandards/ExceptionalStateWaters\(TierIII\).aspx](http://www.deq.virginia.gov/Programs/Water/WaterQualityInformationTMDLs/WaterQualityStandards/ExceptionalStateWaters(TierIII).aspx).
- DEQ (2014A, April 15). *2012 Final Water Quality Assessment GIS Applications, 2012 Final Any Use Map Service*. Retrieved April 15, 2014 from: http://www.deq.virginia.gov/mapper_ext/default.aspx?service=public/2012_adb_anyuse.
- DEQ (2014B, January 15). Virginia Coastal Zone Management Program, Coastal GEMS. Retrieved January 15, 2014 from: <http://www.coastalgems.org/>.
- Department of Game and Inland Fisheries (DGIF) (2011). *Canebrake Rattlesnake Conservation Plan*. Bureau of Wildlife Resources, DGIF, Richmond, VA. 25 pp.
- DGIF (2014, May 19). *Fish Passage Program*. Accessed May 19, 2014 from: <http://www.dgif.virginia.gov/fishing/fish-passage/>.
- DGIF (2013, September 24). *Virginia Fish and Wildlife Information Service (VaFWIS)*. Accessed September 24, 2013 from: <http://vafwis.org/fwis/index.asp>.
- Federal Emergency Management Agency (FEMA) (2012, June 15). *Executive Order 11988: Floodplain Management*. Retrieved April 25, 2014 from: <http://www.fema.gov/environmental-planning-and-historic-preservation-program/executive-order-11988-floodplain-management>
- FEMA (1999, May 2). *Flood Rate Insurance Map: City of Chesapeake, Virginia*. Map Numbers 5100340010C, 5100340011C, 5100340020C, 5100340021C, 5100340022C, 5100340023C, and 5100340024C. Washington, D.C.: Federal Emergency Management Agency.
- FEMA (2013, September 4). *Flood Zones, NFIP Policy Index*. Retrieved November 15, 2013 from: <http://www.fema.gov/floodplain-management/flood-zones>.
- Keeley, Brian W. and Merlin D. Tuttle (1999). *Bats in American Bridges*. Bat Conservation International, Inc., Resource Publication No. 4. Retrieved August 7, 2014 from: <http://www.batcon.org/pdfs/bridges/BatsBridges2.pdf>.
- National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (2012, November 26). *National Marine Fisheries Service, Endangered Species Act Biological Opinion for Federal Highway Administration for the Replacement of the Richmond-Dresden Bridge on Route 197, Maine, NER-2012-2137*. Retrieved April 23, 2014 from: http://www.nero.noaa.gov/protected/section7/bo/actbiops/fhwa_richmond-dresden_bridge_replacement_2012.pdf
- National Park Service (2009, February 27). *National Rivers Inventory – Virginia Segments*. Philadelphia, PA: National Park Service, Rivers, Trails & Conservation Assistance. Retrieved November 15, 2013 from: <http://www.nps.gov/ncrc/programs/rtca/nri/states/va.html>.
- National Wild and Scenic Rivers System (NWSRS) (2013, November 15). *National Wild and Scenic Rivers System, Explore Designated Rivers – Virginia*. Retrieved November 15, 2013 from: <http://www.rivers.gov/virginia.php>.

- NatureServe (2013, November 6). *NatureServe Explorer*. Retrieved November 6, 2013 from: <http://explorer.natureserve.org/servlet/NatureServe?init=Species>.
- NOAA, Office of Protected Resources (2014, April 4). *Atlantic Sturgeon (Acipenser oxyrinchus oxyrinchus)*. Retrieved April 4, 2014 from: <http://www.nmfs.noaa.gov/pr/species/fish/atlanticsturgeon.htm>.
- Priest, Walter I., III PWS, Wetland Design and Restoration (2014, January 13). *Prospectus-Chesapeake Land Development LLC-Steel Street Tidal Mitigation Bank, Chesapeake, Virginia*. Accessed July 24, 2014 from: http://www.nao.usace.army.mil/Portals/31/docs/regulatory/publicnotices/2014/Apr/NAO-2013-0672_PN_Steel_Street_Prospectus.pdf.
- United States Army Corps of Engineers (USACE) (2010, November). *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (Version 2.0)*. Accessed May 21, 2014 from: http://www.usace.army.mil/missions/civilworks/regulatoryprogramandpermits/reg_supp.aspx.
- USACE (2014, April 9). *Regulatory In lieu fee and Bank Information Tracking System (RIBITS)*. Accessed April 9, 2014 from: <https://rsgisias.crrel.usace.army.mil/ribits/f?p=107:2>.
- USACE, Norfolk District and Virginia Department of Environmental Quality (2007, January 18). *Unified Stream Methodology for use in Virginia*. Accessed April 14, 2014 from: http://www.deq.virginia.gov/Portals/0/DEQ/Water/WetlandsStreams/USMFinal_01-18-07.pdf.
- United States Environmental Protection Agency (EPA) (2010, December 29). *Chesapeake Bay Total Maximum Daily Load for Nitrogen, Phosphorus and Sediment*. Retrieved April 17, 2014 from: <http://www.epa.gov/reg3wapd/tmdl/ChesapeakeBay/tmdlexec.html>.
- United States Environmental Protection Agency (EPA) (2008, September 12). *Sole Source Aquifers, Map of Mid-Atlantic Sole Source Aquifers*. Retrieved November 21, 2013 from: <http://www.epa.gov/reg3wapd/drinking/ssa/index.htm>.
- United States Fish and Wildlife Service (USFWS) (2014B, April 4). *Atlantic Sturgeon (Acipenser oxyrinchus)*. Washington, D.C.: U.S. Department of the Interior, U.S. Fish and Wildlife Service. Accessed April 4, 2014 from: <http://www.fws.gov/chesapeakebay/sturgeon.html>.
- USFWS (2013B, September 24). *Information, Planning, and Conservation System*. Washington, D.C.: U.S. Department of the Interior, U.S. Fish and Wildlife Service. Accessed September 24, 2013 from: <http://ecos.fws.gov/ipac/>.
- USFWS (2014A, April 29). *Information, Planning, and Conservation System*. Washington, D.C.: U.S. Department of the Interior, U.S. Fish and Wildlife Service. Accessed April 29, 2014 from: <http://ecos.fws.gov/ipac/>.
- USFWS (2013A, November 8). *National Wetlands Inventory-Wetlands Mapper*. Washington, D.C.: U.S. Department of the Interior, U.S. Fish and Wildlife Service. Accessed November 8, 2013 from: <http://www.fws.gov/wetlands/Wetlands-Mapper.html>.

- USFWS (2014C, April 1). *Northern Long-Eared Bat, Myotis septentrionalis*. Washington, D.C.: U.S. Department of the Interior, U.S. Fish and Wildlife Service. Accessed April 29, 2014 from: <http://www.fws.gov/midwest/endangered/mammals/nlba/>. USFWS (2014A, April 3).
- USFWS (2014D, January 1). *Northern Long-Eared Bat Interim Conference and Planning Guidance, USFWS Regions 2,3,4,5, &6*. Washington, D.C.: U.S. Department of the Interior, U.S. Fish and Wildlife Service. Accessed August 7, 2014 from: <http://www.batcon.org/pdfs/bridges/BatsBridges2.pdf>.
- USFWS (2014A, April 3). *USFWS Bald Eagle Concentration Areas-Virginia*. Washington, D.C.: U.S. Department of the Interior, U.S. Fish and Wildlife Service. Accessed April 3, 2014 from: <http://www.arcgis.com/explorer/?open=8fa548ea54f543a2b2dbe9c9853a81d1>.
- United States Geological Survey (USGS) (2012). *Bowers Hill Quadrangle, Virginia, 7.5-minute series and Norfolk South Quadrangle, Virginia, 7.5-minute series*. City of Chesapeake, VA: U.S. Department of the Interior, U.S. Geological Survey.
- USGS (2013, November 19). *National Map Viewer*. Reston, VA: U.S. Department of the Interior, U.S. Geological Survey. Accessed November 19, 2013 from: <http://viewer.nationalmap.gov/viewer/>.
- United States Government Printing Office (GPO) (2014). *Code of Federal Regulations*. Retrieved April 25, 2014 from: <http://www.gpo.gov/fdsys/pkg/CFR-2009-title23-vol1/pdf/CFR-2009-title23-vol1-sec650-105.pdf>.
- Virginia Department of Transportation [VDOT]. (2014a). *Alternatives Development Technical Memorandum*. Richmond, Virginia: Virginia Department of Transportation. (Unpublished Report).
- Virginia Department of Transportation [VDOT]. (2014b). *Bridge Design Manual. Volume V, Part 2*. Richmond, Virginia. Retrieved from <http://www.virginiadot.org/business/bridge-manuals.asp>
- Virginia Department of Transportation [VDOT]. (2014c). *Traffic and Transportation Technical Report*. Richmond, Virginia: Virginia Department of Transportation. (Unpublished Report).

APPENDIX A: AGENCY COORESPONDENCE

MEMORANDUM

DATE: September 20, 2013

TO: Scott Smizik, VDOT

FROM: Alli Baird, DCR-DNH

SUBJECT: Due September 25, 2013
0064-131-783, P101, Interstate 64 Widening and High Rise Bridge Replacement Study

The Department of Conservation and Recreation (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

According to the information currently in our files, the Great Dismal Swamp Conservation Site is located in the project vicinity. Conservation sites are tools for representing key areas of the landscape that warrant further review for possible conservation action because of the natural heritage resources and habitat they support. Conservation sites are polygons built around one or more rare plant, animal, or natural community designed to include the element and, where possible, its associated habitat, and buffer or other adjacent land thought necessary for the element's conservation. Conservation sites are given a biodiversity significance ranking based on the rarity, quality, and number of element occurrences they contain; on a scale of 1-5, 1 being most significant. Great Dismal Swamp Conservation Site has been given a biodiversity significance ranking of B2, which represents a site of very high significance. The natural heritage resource of concern at this site is:

<i>Sorex longirostris fisheri</i>	Dismal Swamp southeastern shrew	G5T4/S2/NL/LT
-----------------------------------	---------------------------------	---------------

The Dismal Swamp southeastern shrew occurs from southeastern Virginia to southeastern North Carolina along the outer coastal plain (U.S. Fish and Wildlife Service, 1998). They occupy a wide variety of habitats, including recently clearcut and regenerating forests, young pine plantations, grassy and brushy roadsides, young forests with shrubs and saplings, and mature pine and deciduous forests. Early successional stages with dense understories support the largest numbers of Dismal Swamp southeastern shrews, but mature pine plantations and mature second growth hardwood forests can also have significant numbers, particularly if there is a dense understory. Despite the lower densities in mature forests, these habitats are likely to be important to the long-term survival of Dismal Swamp southeastern shrew populations (U.S. Fish and Wildlife Service, 1998).

Threats to the Dismal Swamp southeastern shrew include draining and drying of its preferred habitat which allows the more upland *Sorex longirostris longirostris* to invade and compete against it (Rose and Padgett, 1991). Please note that this species is currently classified as threatened by the Virginia Department of Game and Inland Fisheries (VDGIF).

Due to the potential for this site to support populations of Dismal Swamp southeastern shrew, DCR recommends a habitat assessment for the resource in a 0.5 mile section from 0.25 mile north to 0.25 mile south of the junction of I-64 and US Rt. 13/460 and in the powerline and adjacent wetlands approximately

one mile to the west.. With the survey results we can more accurately evaluate potential impacts to natural heritage resources and offer specific protection recommendations for minimizing impacts to the documented resources. Due to the legal status of Dismal Swamp southeastern shrew, DCR also recommends coordination with Virginia's regulatory authority for the management and protection of this species, the VDGIF, to ensure compliance with the Virginia Endangered Species Act (VA ST §§ 29.1-563 – 570).

DCR-Division of Natural Heritage biologists are qualified and available to conduct inventories for rare, threatened, and endangered species. Please contact J. Christopher Ludwig, Natural Heritage Inventory Manager, at chris.ludwig@dcr.virginia.gov or 804-371-6206 to discuss arrangements for field work.

There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the DCR, DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

New and updated information is continually added to Biotics. Please contact DCR for an update on this natural heritage information if a significant amount of time passes before it is utilized.

All VDOT projects on state-owned lands must comply with the Virginia Erosion & Sediment Control (ESC) Law and Regulations, the Virginia Stormwater Management (SWM) Law and Regulations, the most current version of the DCR approved VDOT Annual ESC and SWM Specifications and Standards, and the project-specific ESC and SWM plans. [Reference: VESCL §10.1-560, §10.1-564; VESCR §4VAC50-30 et al; VSWML §10.1-603 et al; VSWMR §4VAC-3-20 et al].

The Virginia Department of Game and Inland Fisheries (VDGIF) maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters, that may contain information not documented in this letter. Their database may be accessed from <http://vafwis.org/fwis>, or contact Gladys Cason (804-367-0909 or Gladys.Cason@dgif.virginia.gov). This project is located within 2 miles of a documented occurrence of a state listed animal. Therefore, DCR recommends coordination with VDGIF, Virginia's regulatory authority for the management and protection of this species to ensure compliance with the Virginia Endangered Species Act (VA ST §§ 29.1-563 – 570).

Thank you for the opportunity to comment on this project.

Cc: Amy Ewing, VDGIF

Literature Cited

Rose, R.K. and T.M. Padgett. 1991. Southeastern shrew. In Virginia's Endangered Species: Proceedings of a Symposium. K. Terwilliger ed. The McDonald and Woodward Publishing Company, Blacksburg, Virginia. pp. 562-564.

U.S. Fish and Wildlife Service. 1998. Endangered and threatened wildlife and plants; proposed rule to delist the Dismal Swamp southeastern shrew (*Sorex longirostris fisheri*). Federal Register 63 (203) 56128-56134.

Carl E. Garrison III
State Forester



COMMONWEALTH of VIRGINIA

DEPARTMENT OF FORESTRY
900 Natural Resources Drive, Suite 800
Charlottesville VA 22903
434.977.6555 ~ Fax: 434.296.2369
www.dof.virginia.gov

September 18, 2013

TO: Scott Smizik, VDOT Project Manager
FROM: Greg Evans, VDOF
SUBJECT: Interstate 64 Widening and High-Rise Bridge Replacement Location Study, City of Chesapeake
VDOT Project Number 0064-131-783, P101; UPC: 104366

I am writing in response to your August 26, 2013 letter to Mr. Carl Garrison, the Virginia State Forester inviting the Department of Forestry (DOF) to provide comments and identify environmental resources in and around the above named project for a scoping study. The Department of Forestry appreciates the opportunity to work with the Virginia Department of Transportation (VDOT) and take advantage of opportunities to use planning decisions and information in the NEPA process to ensure environmental concerns are addressed. The Department of Forestry is charged with conserving the Commonwealth's forest resources for the use and enjoyment of current and future generations of Virginia citizens and its comments reflect that charge.

It is our understanding from your letter to Mr. Garrison that the purpose of the current study is to develop alternative solutions to address insufficient transportation capacity and correct roadway and bridge deficiencies throughout the project corridor. With that as the context, DOF supports as a build alternative, widening the existing highway corridor rather than creating a new one. Such an action will minimize adverse impacts on the area's natural resources.

DOF notes that while it was prepared for a different but adjacent I-64 study area, some of VDOT's natural resources findings in its 2012 *Interstate 64 Peninsula Study Draft Environmental Impact Statement Natural Resources Technical Memorandum* covering the portions of I-64 from Richmond south to Hampton Roads are applicable as well to the I-64 Widening and High-Rise Bridge Replacement Location study area. That memorandum summarized the natural resources found in the Coastal Plain physiographic province as follows: "[a] variety of upland forest communities and diverse tidal and freshwater wetlands and stream systems....The upland forests that originally covered much of the Virginia Coastal Plain have been extensively cleared or altered, making it difficult to determine which species and natural

communities were once naturally prevalent. Much of the contemporary forest consists of successional or silvicultural stands of loblolly pine (*Pinus taeda*) and secondary pine-hardwood forests that have developed after repeated timbering or agricultural abandonment. The most mature remnant stands on mesic uplands are typically characterized by associations of American beech (*Fagus grandifolia*), several oaks (*Quercus* spp.), and American holly (*Ilex opaca* var. *opaca*)....”

The City of Chesapeake’s 2026 Comprehensive Plan further characterizes the natural resources in the area as follows: “The City is located in the northern extent of what is known as the Southeastern Evergreen Forest Region (DCR, Natural Heritage, 1998), which stretches from southeastern Virginia along the Gulf Coast to eastern Texas. According to the Natural Heritage Division of the Virginia Department of Conservation and Recreation, this ecosystem is characterized by pine and pine-hardwood communities, along with large areas of swamp land. Examples of typical vegetation found in such areas include Pond Pine, Atlantic White Cedar, Red Maple, Loblolly Pine and Black Needle Rush Marsh” (Forward Chesapeake 2026 Comprehensive Plan, pp. 117-118).

Under the heading “Potential Impacts and Mitigation Measures” and subheading “Build Alternatives” the 2012 VDOT DEIS technical memorandum completed for the other I-64 segments from Richmond to Norfolk also concluded that “[a]ll of the Build Alternatives have the potential to impact terrestrial and aquatic habitat or species along the study area corridor. Extensive coordination with the different agencies should continue throughout all stages of project development to reduce potential impacts to these resources. In addition, avoidance and minimization of potential impacts to the natural environment and wildlife should be considered throughout the design and construction phases of the project. Permitting of the project would also address avoidance, minimization, and compensatory mitigation measures, as needed.”

DOF notes that all build alternatives that may be considered for the 64 Widening and High-Rise Bridge Replacement Location Study segment of I-64 will also have the same potential to impact terrestrial and aquatic habitat or species along its study area corridor and recommends that VDOT adopt the same coordination, design and construction recommendations as stated above for this I-64 segment too.

Aerial photos of the study area for the 64 Widening and High-Rise Bridge Replacement project show it to be urbanized and highly developed. There are however, two significant forested areas DOF recommends be avoided as much as possible in the design of the project. One is located on the border of City of Portsmouth and City of Chesapeake land west of Cavalier Blvd. and stretches to the intersection of I-664, I-264 and I-64. That forested area also borders two lakes (Lake Cavalier and Lake Forest) and provides some recreational benefits. A private canoe launch site is identified there (Forward Chesapeake 2026 Comprehensive Plan, Map 19 Public Waterfront Access, p. 146). The second large forested area is located at the eastern end of the project study area in the vicinity of the High Rise Bridge. That forest also provides recreational benefits and is identified as a city neighborhood park with potential water access (Forward Chesapeake 2026 Comprehensive Plan, Map 20 Potential Water Access Sites, p. 148).

In addition to the identified recreational services, it can also be presumed that both of these forests provide water quality benefits due to their proximity to water bodies. The WIP II guidance offered to localities for addressing TMDL requirements describes forestland as the best land use for meeting water quality objectives. Furthermore, the City of Chesapeake's comprehensive plan cites as a planning strategy incorporating consideration of adjacent or nearby documented natural areas or environmentally sensitive areas into site plan assessments with the objective being to minimize impacts to these areas (Forward Chesapeake 2026 Comprehensive Plan, p. 148).

DOF notes too, that the project's study area is within a Chesapeake Bay preservation area (Forward Chesapeake 2026 Comprehensive Plan, Map 15 Chesapeake Bay Preservation Areas, p. 131) and that most of the land in the study area is classified as upland (Forward Chesapeake 2026 Comprehensive Plan, Map 18 National Wetland Inventory, p. 141). As such, the forests DOF has identified for avoidance mitigation are upland forests. DOF understands that VDOT is exempt from the Chesapeake Bay Preservation Act in this instance, but notes that the exemption is qualified by the road alignment and design being optimized "consistent with all applicable requirements, to prevent or otherwise minimize the encroachment in the RPA and to minimize the adverse effects on water quality" (Chesapeake Bay Preservation Act, Sec. 23-13. Exemptions (a)(1) a. Page 23-17). The location of the two forested areas DOF has identified for avoidance mitigation are therefore also located in a sensitive environmental zone in addition to being important for recreational and water quality management purposes. Section 6001 of SAFETEA-LU requires statewide long-range plans to discuss environmental mitigation opportunities and specifically references upland forests as a land use for which mitigation plans should be developed. FHWA policy guidance endorses an "ecosystem approach" as a framework through which VDOT can meet the Section 6001 requirements.

This concludes our comments. Please advise if you require any additional information or would like to discuss these recommendations.

Greg Evans
Voluntary Mitigation Program Manager
Forestland Conservation Division
Virginia Department of Forestry
900 Natural Resources Drive, Suite 800
Charlottesville, VA 22903
434-220-9020



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
6669 Short Lane
Gloucester, Virginia 23061



FEB 04 2013

Greetings:

Due to increases in workload and refinement of our priorities in Virginia, this office will no longer provide individual responses to requests for environmental reviews. However, we want to ensure that U.S. Fish and Wildlife Service trust resources continue to be conserved. When that is not possible, we want to ensure that impacts to these important natural resources are minimized and appropriate permits are applied for and received. We have developed a website, http://www.fws.gov/northeast/virginiafield/endspecies/Project_Reviews_Introduction.html, that provides the steps and information necessary to allow landowners, applicants, consultants, agency personnel, and any other individual or entity requiring review/approval of their project to complete a review and come to the appropriate conclusion.

The website will be frequently updated to provide new species/trust resource information and methods to review projects, so refer to the website for each project review to ensure that current information is utilized.

If you have any questions about project reviews or need assistance, please contact Troy Andersen of this office at (804) 693-6694, extension 166, or troy_andersen@fws.gov. For problems with the website, please contact Mike Drummond of this office at mike_drummond@fws.gov.

Sincerely,

Cindy Schulz
Supervisor
Virginia Field Office

From: [Dufore, Ezekiel \(VDH\)](#)
To: [Smizik, Scott \(VDOT\)](#)
Cc: [Matthews, Barry \(VDH\)](#); [Albrecht, Edward \(VDH\)](#)
Subject: Interstate 64 Widening and High Rise Bridge Replacement Location Study
Date: Friday, August 30, 2013 4:51:25 PM

Project #: 0064-131-783, P101
UPC #: 104366
Location: Chesapeake

VDH – Office of Drinking Water has reviewed the above project. Below are our comments as they relate to proximity to **public drinking water sources** (groundwater wells, springs and surface water intakes). Potential impacts to public water distribution systems or sanitary sewage collection systems must be verified by the local utility.

No groundwater wells are within a 1 mile radius of the project site.

No surface water intakes are located within a 5 mile radius of the project site.

The project is not within Zone 1 (up to 5 miles into the watershed) or Zone 2 (greater than 5 miles into the watershed) of any public surface water sources.

There are no apparent impacts to public drinking water sources due to this project.

Ezekiel Dufore

Office of Drinking Water
Virginia Department of Health
James Madison Building
109 Governor Street
Richmond, VA 23219
(w) 804-864-7201
ezekiel.dufore@vdh.virginia.gov



COMMONWEALTH of VIRGINIA

Marine Resources Commission

2600 Washington Avenue
Third Floor
Newport News, Virginia 23607

Douglas W. Domenech
Secretary of Natural Resources

Jack G. Travelstead
Commissioner

October 1, 2013

Mr. Scott Smizik, AICP
VDOT Project Manager
Virginia Department of Transportation
1401 East Broad Street
Richmond, Virginia 23219

RE: Interstate 64 Widening and High-Rise Bridge Replacement Location Study, City of Chesapeake (VDOT Project #0064-131-783, P101; UPC: 104366)

Dear Mr. Smizik:

Please be advised that the Commission, pursuant to Section 28.2-1200 et seq of the Code of Virginia, has jurisdiction over any encroachments in, on, or over the beds of the bays, ocean, rivers, streams, or creeks which are the property of the Commonwealth. Accordingly, if any portion of the subject project involves any encroachments channelward of mean low water, a permit may be required from our agency. Additionally, VMRC currently acts as the Wetlands Board in the City of Chesapeake, therefore, a permit may also be required for impacts to tidal wetlands. Any jurisdictional impacts will be reviewed by VMRC during the Joint Permit Application process. Thank you for the opportunity to comment.

Regards,

A handwritten signature in black ink, appearing to read "Justine R. Woodward".

Justine R. Woodward
Environmental Engineer

JRW/jaj
HM

cc: DEQ Office of Environmental Impact Review

An Agency of the Natural Resources Secretariat

www.mrc.virginia.gov

Telephone (757) 247-2200 (757) 247-2292 V/TDD Information and Emergency Hotline 1-800-541-4646 V/TDD

APPENDIX B: WETLAND DATA SHEETS

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 11/12/2013
 Applicant/Owner: VDOT State: VA Sampling Point: WL-1
 Investigator(s): Glenn Wilson and Catherine Harold Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Interstate interchange Local relief (concave, convex, none): concave Slope (%): 0-0.5%
 Subregion (LRR or MLRA): LRR T Lat: 36° 47' 12.51" Long: 76° 24' 10.51" Datum: WGS 84
 Soil Map Unit Name: Urban land-Conetoe-Chesapeake-Tetotum complex NWI classification: E2EM1P
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Remarks: PEM5 Wetland (<i>Phragmites australis</i> dominant) Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location) Wetland is located in the median of I-64 without a tidal influence	

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)
<input type="checkbox"/> Marl Deposits (B15) (LRR U)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): <u>-</u> Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>6"</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>6"</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
---	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Wetland is well defined depressional PEM with Phragmites almost exclusively

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 11/12/2013Sampling point: WL-1**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Phragmites australis</u>	100	Y	FACW
Common Reed	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
Total Cover: 100	50% of total cover 20% of total cover	50% 20%	_____

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Smilax rotundifolia</u>	5	Y	FAC
Horsebrier	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 5	50% of total cover 20% of total cover	3% 1%	_____

Dominance Test worksheet:

Number of Dominant species
That are OBL, FACW, or FAC: 2 (A)

Total number of Dominant
Species across All Strata: 2 (B)

Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is $\leq 3.0^1$
- ☐ 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling /Shrub - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

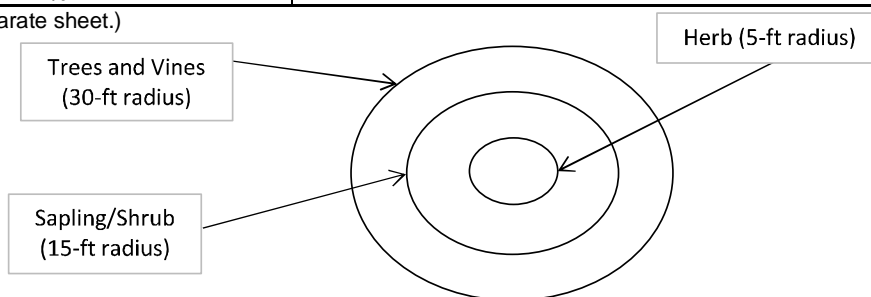
Woody Vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present?

Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Wetland margins contain *Smilax rotundifolia* and *Arundinaria gigantea*



Project/Site: I-64 /High Rise Bridge Corridor Study

Sampling date: 11/12/2013

Sampling point: WL-1

Soil**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	10YR 3/3	100					loam	saturated
2-9	10YR 5/1	100					fine sandy loam	saturated
9-16	10YR 4/1	100					fine sandy loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks: Redox features were difficult to see. Soil was saturated

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: <u>I-64 /High Rise Bridge Corridor Study</u>		City/County: <u>City of Chesapeake</u>	Sampling Date: <u>2/6/2014</u>
Applicant/Owner: <u>VDOT</u>		State: <u>VA</u>	Sampling Point: <u>WL-2</u>
Investigator(s): <u>David Kwasniewski and Glenn Wilson</u>		Section, Township, Range: _____	
Landform (hillslope, terrace, etc.): <u>floodplain</u>		Local relief (concave, convex, none): <u>none</u>	Slope (%): <u>0-1%</u>
Subregion (LRR or MLRA): <u>LRR T</u>	Lat: <u>36° 47' 09.12"</u>	Long: <u>76° 24' 09.01"</u>	Datum: <u>WGS 84</u>
Soil Map Unit Name: <u>Conetoe-Chesapeake-Tetotum complex</u>		NWI classification: <u>N/A</u>	
Are climatic / hydrologic conditions on the site typical for this time of year? Yes <u>X</u> No _____ (If no, explain in Remarks.)			
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed?		Are "Normal Circumstances" present? Yes <u>X</u> No _____	
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)			

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Remarks: PFO Wetland Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location) Wetland is located south of I-64 without a tidal influence	

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	
<input checked="" type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Aquatic Fauna (B13) <input checked="" type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Marl Deposits (B15) (LRR U) <input checked="" type="checkbox"/> Saturation (A3) <input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Presence of Reduced Iron (C4) <input checked="" type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Recent Reduction in Tilled Soils (C6) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input checked="" type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)

Field Observations: Surface Water Present? Yes <u>X</u> No _____ Depth (inches): <u>3"</u> Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>0"</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>0"</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
--	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Data recorded in February, with over 0.5" of precip in the previous week.

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/6/2014Sampling point: WL-2**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer rubrum</u> Red maple	50	Y	FAC
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 50	50% of total cover 20% of total cover	25% 10%	_____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Morella cerifera</u> wax myrtle	40	Y	FAC
2. <u>Pinus taeda</u> loblolly pine	15	Y	FAC
3. <u>Liquidambar styraciflua</u> sweet gum	10	N	FAC
4. <u>Acer rubrum</u> red maple	10	N	FAC
5. _____	_____	_____	_____
Total Cover: 75	50% of total cover 20% of total cover	38% 15%	_____

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. _____ Netted chain fern	_____	_____	_____
2. _____ Lizard's tail	_____	_____	_____
3. _____ Posion ivy	_____	_____	_____
4. <u>Smilax rotundifolia</u>	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Dominance Test worksheet:

Number of Dominant species That are OBL, FACW, or FAC: 3 (A)

Total number of Dominant Species across All Strata: 3 (B)

Percent of Dominant Species That are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of	Multiply by:	
OBL species <u>FALSE</u>	x 1 =	<u>0</u>
FACW species <u>FALSE</u>	x 2 =	<u>0</u>
FAC species <u>FALSE</u>	x 3 =	<u>0</u>
FACU species <u>FALSE</u>	x 4 =	<u>0</u>
UPL species <u>FALSE</u>	x 5 =	<u>0</u>
Column Totals: <u>0</u>	(A)	<u>0</u> (B)
Prevalence Index = B/A =		<u>0</u>

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- x 2 - Dominance Test is >50%
- 3 - Prevalence Index is $\leq 3.0^1$
- 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

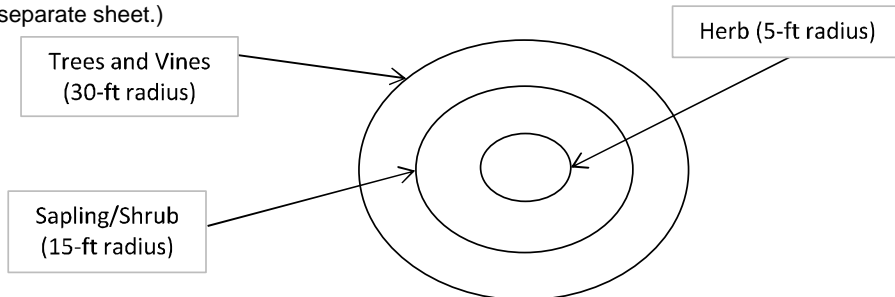
Sapling /Shrub - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present?Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)



Soil**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	10YR 4/2	100					fine sandy loam	wet
3-6	10YR 6/2	80	10YR 5/6	20			loamy sand	wet
6-10	10YR 6/1	80	10YR 5/6	20			sandy clay	wet
10-16+	Gley 2 6/5B	60	10YR 6/6	40			sandy clay	wet

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks: sulfidic odors observed in upper 12"
a second profile was taken on 4/21/2014

Depth (inches)	Matrix		Redox Features		Type ¹	Loc ²	Texture	Remarks
	Color (moist)	%	Color (moist)	%				
0-2	10YR 3/1	100					loam	
2-4	10YR 5/1	96-97	10YR 3/4	3-4			silt loam	
4-7	10YR 5/1	80-85	10YR 4/6	15-20			sandy loam	
7-18+	10YR 6/1	100					sand	

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 11/13/2013
 Applicant/Owner: VDOT State: VA Sampling Point: WL-3
 Investigator(s): Glenn Wilson and Catherine Harold Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): drainage in median Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 47' 11.74" Long: 76° 24' 04.06" Datum: WGS 84
 Soil Map Unit Name: Urban land-Conetoe-Chesapeake-Tetotum complex NWI classification: PFO1B
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____ Remarks: PEM Wetland Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location) Wetland is located south of I-64 without a tidal influence Area receive runoff from surrounding interstate pavement.
---	--

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)

Field Observations: Surface Water Present? Yes <u>X</u> No _____ Depth (inches): <u>8-10"</u> Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>0"</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>0"</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
---	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Hummocks, water stained leaves, sharply defined wetland by highway slopes

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 11/13/2013Sampling point: WL-3**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer rubrum</u>	5	Y	FAC
Red Maple	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 5	50% of total cover 20% of total cover	3% 1%	_____

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Phragmites australis</u>	30	Y	FACW
Common Reed	_____	_____	_____
2. <u>Scirpus cyperinus</u>	10	N	OBL
Cottongrass Bulrush	_____	_____	_____
3. <u>Leersia oryzoides</u>	10	N	OBL
Rice Cut Grass	_____	_____	_____
4. <u>Arundinaria gigantea</u>	5	N	FACW
Giant Cane	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
Total Cover: 55	50% of total cover 20% of total cover	28% 11%	_____

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Dominance Test worksheet:

Number of Dominant species
That are OBL, FACW, or FAC: 2 (A)

Total number of Dominant
Species across All Strata: 2 (B)

Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- x 2 - Dominance Test is >50%
- 3 - Prevalence Index is ≤ 3.0 ¹
- 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

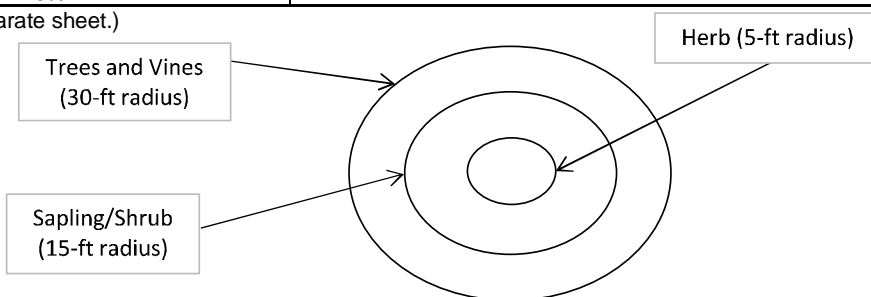
Sapling /Shrub - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present?Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)
decay logs



Project/Site: I-64 /High Rise Bridge Corridor Study

Sampling date: 11/13/2013

Sampling point: WL-3

Soil**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-10	10YR 2/1	100					fine sandy loam	saturated
10-20	10YR 6/1	100					fine sand	saturated

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks:

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 11/12/2013
 Applicant/Owner: VDOT State: VA Sampling Point: WL-4
 Investigator(s): Glenn Wilson and Catherine Harold Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0-2%
 Subregion (LRR or MLRA): LRR T Lat: 36° 47' 06.34" Long: 76° 24' 01.17" Datum: WGS 84
 Soil Map Unit Name: Nawney Silt loam NWI classification: PFO4R
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Remarks: PFO Wetland Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location) Wetland is located south of I-64 without a tidal influence	

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3)	<input checked="" type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)
<input type="checkbox"/> Marl Deposits (B15) (LRR U)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): <u>-</u> Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>2"</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>2"</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
---	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 11/12/2013Sampling point: WL-4**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer rubrum</u> Red Maple	30	Y	FAC
2. <u>Liquidambar styraciflua</u> Sweet-Gum	30	Y	FAC
3. <u>Nyssa sylvatica</u> Black Tupelo	10	N	FAC
4. _____	_____	_____	_____
Total Cover: 70	50% of total cover 20% of total cover	35% 14%	_____

Dominance Test worksheet:Number of Dominant species
That are OBL, FACW, or FAC: 5 (A)Total number of Dominant
Species across All Strata: 6 (B)Percent of Dominant Species
That are OBL, FACW, or FAC: 83% (A/B)**Prevalence Index worksheet:**

Total % Cover of Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is $\leq 3.0^1$
- 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

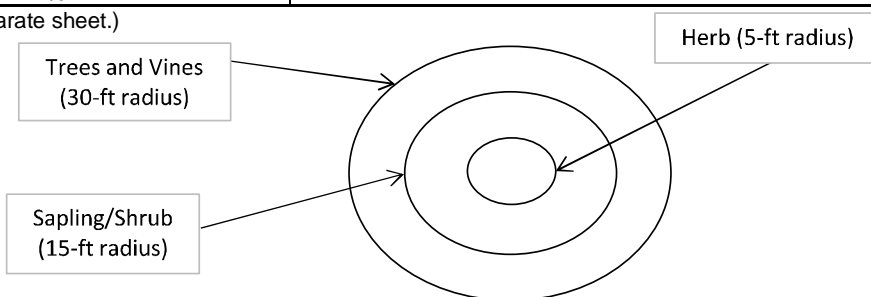
¹Indicators of hydric soil and wetland hydrology must be present**Definitions of Four Vegetation Strata:****Tree** - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.**Sapling /Shrub** - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.**Woody Vine** - All woody vines greater than 3.28 ft in height.**Hydrophytic Vegetation****Present?** Yes X No _____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer rubrum</u> Red Maple	_____	_____	FAC
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Saururus cernuus</u> Lizard's-Tail	5	Y	OBL
2. <u>Woodwardia areolata</u> Netted Chain Fern	5	Y	OBL
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
Total Cover: 10	50% of total cover 20% of total cover	5% 2%	_____

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Smilax rotundifolia</u> Horsebrier	5	Y	FAC
2. <u>Lonicera japonica</u> Limber Honeysuckle	5	Y	FACU
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 10	50% of total cover 20% of total cover	5% 2%	_____

Remarks: (Include photo numbers here or on a separate sheet.)



Project/Site: I-64 /High Rise Bridge Corridor Study

Sampling date: 11/12/2013

Sampling point: WL-4

Soil

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	10YR 2/1	100					loam	saturated
2-13+	10YR 4/1	100					clay loam	saturated

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

Indicators for Problematic Hydric Soils³:

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input checked="" type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks: Hummocks, multiple trunks, buttressed trees, hypertrophied lenticles, stained leaves, wetland drainage patterns (small channels/networks)

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 2/6/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-4A
 Investigator(s): David Kwasniewski and Glenn Wilson Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 47' 09.63" Long: 76° 24' 06.13" Datum: WGS 84
 Soil Map Unit Name: Conetoe-Chesapeake-Tetotum complex; Nawney silt loam NWI classification: N/A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Remarks: PEM Wetland Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location) Wetland is located south of I-64 without a tidal influence	

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply) <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Aquatic Fauna (B13) <input checked="" type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Marl Deposits (B15) (LRR U) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Recent Reduction in Tilled Soils (C6) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input checked="" type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input checked="" type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)

Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): <u>-</u> Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>0"</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>0"</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
---	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Data recorded in February, with over 0.5" of precip in the previous week.

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/6/2014Sampling point: WL-4A**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Morella cerifera</u> <u>wax myrtle</u>	10	Y	FAC
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 10	50% of total cover 20% of total cover	5% 2%	_____

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Leersia oryzoides</u> <u>rice cut grass</u>	50	Y	OBL
2. <u>Hibiscus moscheutos</u> <u>swamp rosemallow</u>	30	Y	OBL
3. <u>Phragmites australis</u> <u>common reed</u>	15	N	FACW
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
Total Cover: 95	50% of total cover 20% of total cover	48% 19%	_____

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Dominance Test worksheet:

Number of Dominant species
That are OBL, FACW, or FAC: 3 (A)

Total number of Dominant
Species across All Strata: 3 (B)

Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____	(A) _____ (B) _____
Prevalence Index = B/A = _____	

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
x 2 - Dominance Test is >50%
3 - Prevalence Index is $\leq 3.0^1$
4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

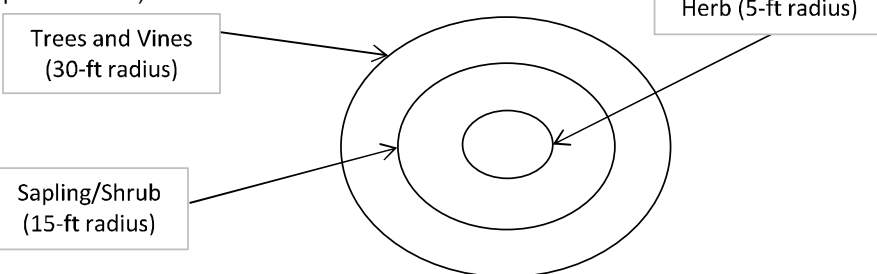
Sapling /Shrub - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present?Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

PEM wetland surrounded by *Pinus taeda* forest

Project/Site: I-64 /High Rise Bridge Corridor Study

Sampling date: 2/6/2014

Sampling point: WL-4A

Soil**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	10YR 4/2	100					silt loam	wet, many roots
4-8+	10YR 3/1	100					silt loam	wet

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input checked="" type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks: no odors observed
soil too saturated to stay in bucket below 8"
Redox concentrations may have been too difficult to observe due to excessive moisture in the soil column.

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 11/13/2013
 Applicant/Owner: VDOT State: VA Sampling Point: WL-5
 Investigator(s): Glenn Wilson and Catherine Harold Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): drainage swale (utility ROW) Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 47' 00.38" Long: 76° 24' 01.95" Datum: WGS 84
 Soil Map Unit Name: Nawney Silt loam NWI classification: N/A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Remarks: PEM wetland Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location) Wetland is located south of I-64 without a tidal influence In utility ROW, maintained and free of woody vegetation (OHE and Sewage ROW)	

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)
<input type="checkbox"/> Marl Deposits (B15) (LRR U)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations: Surface Water Present? Yes <u>X</u> No _____ Depth (inches): <u>0"</u> Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>0"</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>0"</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
--	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Water is at soil surface

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 11/13/2013Sampling point: WL-5**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Dominance Test worksheet:Number of Dominant species
That are OBL, FACW, or FAC: 3 (A)Total number of Dominant
Species across All Strata: 3 (B)Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)**Prevalence Index worksheet:**

Total % Cover of Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is $\leq 3.0^1$
- ☐ 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

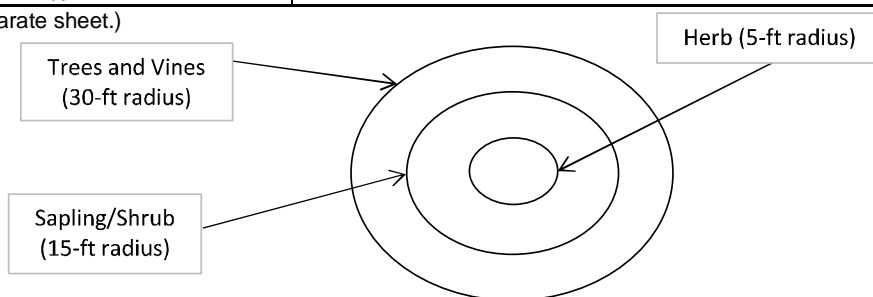
¹Indicators of hydric soil and wetland hydrology must be present**Definitions of Four Vegetation Strata:****Tree** - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.**Sapling /Shrub** - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.**Woody Vine** - All woody vines greater than 3.28 ft in height.**Hydrophytic Vegetation Present?**Yes X No _____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Rubus spp.</u>	<u>< 5</u>	<u>Y</u>	<u>FAC</u>
Tree Blackberry	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Arthroxon hispidus</u>	<u>95</u>	<u>Y</u>	<u>FAC</u>
Small Carp Grass	_____	_____	_____
2. <u>Persicaria hydropiper</u>	<u>2</u>	<u>N</u>	<u>OBL</u>
Mild Water-Pepper	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
Total Cover: 97	50% of total cover 20% of total cover	49% 19%	_____

Ren	Absolute % Cover	Dominant Species?	Indicator Status
Woody Vine Stratum ()	_____	_____	_____
1. <u>Lonicera japonica</u>	<u>5</u>	<u>Y</u>	<u>FAC</u>
Japanese Honeysuckle	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 5	50% of total cover 20% of total cover	3% 1%	_____

Remarks: (Include photo numbers here or on a separate sheet.)



Project/Site: I-64 /High Rise Bridge Corridor Study

Sampling date: 11/13/2013

Sampling point: WL-5

Soil

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	10YR 2/2	100					loam	saturated
4-10	10YR 3/1	100					fine sandy loam	saturated
10-16	10YR 4/2	100					fine sandy loam	saturated

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

Indicators for Problematic Hydric Soils³:

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks:

Remarks: Water is at soil surface

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: <u>I-64 /High Rise Bridge Corridor Study</u>		City/County: <u>City of Chesapeake</u>	Sampling Date: <u>2/6/2014</u>
Applicant/Owner: <u>VDOT</u>		State: <u>VA</u>	Sampling Point: <u>WL-6</u>
Investigator(s): <u>David Kwasneiwski and Glenn Wilson</u>		Section, Township, Range: _____	
Landform (hillslope, terrace, etc.): <u>Toe of Slope</u>		Local relief (concave, convex, none): <u>none</u>	Slope (%): <u>0-1%</u>
Subregion (LRR or MLRA): <u>LRR T</u>	Lat: <u>36° 47' 08.27"</u>	Long: <u>76° 23' 50.57"</u>	Datum: <u>WGS 84</u>
Soil Map Unit Name: <u>Munden-Urban land complex</u>		NWI classification: <u>N/A</u>	
Are climatic / hydrologic conditions on the site typical for this time of year? Yes <u>X</u> No _____ (If no, explain in Remarks.)			
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed?		Are "Normal Circumstances" present? Yes <u>X</u> No _____	
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic?		(If needed, explain any answers in Remarks.)	

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Remarks: PFO Wetland Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location) Wetland is located in median of I-64 without a tidal influence	

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input checked="" type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Shallow Aquitard (D3)
<input checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)
<input type="checkbox"/> Marl Deposits (B15) (LRR U)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:			
Surface Water Present?	Yes _____ No <u>X</u>	Depth (inches):	- _____
Water Table Present?	Yes <u>X</u> No _____	Depth (inches):	0" _____
Saturation Present?	Yes <u>X</u> No _____	Depth (inches):	0" _____
(includes capillary fringe)			
Wetland Hydrology Present?		Yes <u>X</u> No _____	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Data recorded in February, with over 0.5" of precip in the previous week.
 Iron oxide bacteria observed on surface.

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/6/2014Sampling point: WL-6**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer rubrum</u> <u>red maple</u>	50	Y	FAC
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 50	50% of total cover 20% of total cover	25% 10%	_____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer rubrum</u> <u>red maple</u>	70	Y	FAC
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 70	50% of total cover 20% of total cover	35% 14%	_____

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Toxicodendron radicans</u> <u>poison ivy</u>	70	Y	FAC
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 70	50% of total cover 20% of total cover	35% 14%	_____

Dominance Test worksheet:Number of Dominant species
That are OBL, FACW, or FAC: 3 (A)Total number of Dominant
Species across All Strata: 3 (B)Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)**Prevalence Index worksheet:**

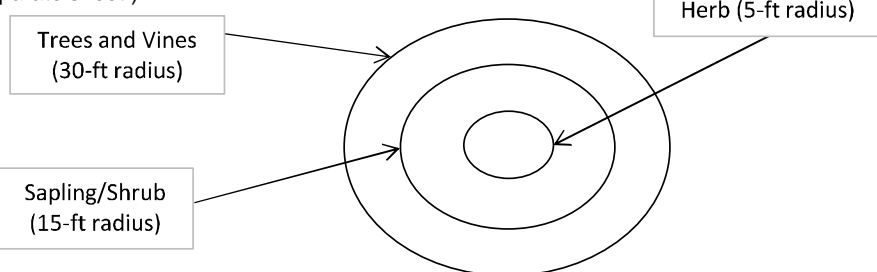
Total % Cover of	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____	(A) _____ (B) _____
Prevalence Index = B/A = _____	

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
 x 2 - Dominance Test is >50%
 3 - Prevalence Index is $\leq 3.0^1$
 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
 Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present**Definitions of Four Vegetation Strata:****Tree** - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.**Sapling /Shrub** - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.**Woody Vine** - All woody vines greater than 3.28 ft in height.**Hydrophytic Vegetation Present?**Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)



Project/Site: I-64 /High Rise Bridge Corridor Study

Sampling date: 2/6/2014

Sampling point: WL-6

Soil

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	10YR 3/1	100					fine sandy loam	wet, many roots
4-9	10YR 5/1	100					sand	wet
9-12+	10YR 4/1	100					sandy clay loam	wet

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

Indicators for Problematic Hydric Soils³:

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks: no odors observed

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 2/6/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-7
 Investigator(s): David Kwasniewski and Glenn Wilson Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Toe of Slope Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 47' 06.21" Long: 76° 23' 45.79" Datum: WGS 84
 Soil Map Unit Name: Munden-Urban land complex; Dragston; Conetoe-Chesapeake-Tetotum complex NWI classification: N/A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Remarks: PFO Wetland Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location) Wetland is located in median of I-64 without a tidal influence	

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input checked="" type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input checked="" type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Shallow Aquitard (D3)
<input checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)
<input type="checkbox"/> Marl Deposits (B15) (LRR U)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations: Surface Water Present? Yes <u>X</u> No _____ Depth (inches): <u>2"</u> Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>0"</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>0"</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
--	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Data recorded in February, with over 0.5" of precip in the previous week.
 Iron oxide bacteria observed on leaf pack in surface water.

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/6/2014Sampling point: WL-7**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer rubrum</u> red maple	60	Y	FAC
2. <u>Liquidambar styraciflua</u> sweet gum	25	Y	FAC
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 85	50% of total cover 20% of total cover	43% 17%	_____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer rubrum</u> red maple	40	Y	FAC
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 40	50% of total cover 20% of total cover	20% 8%	_____

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Dominance Test worksheet:

Number of Dominant species
That are OBL, FACW, or FAC: 3 (A)

Total number of Dominant
Species across All Strata: 3 (B)

Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____	(A) _____ (B) _____
Prevalence Index = B/A = _____	

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
 x 2 - Dominance Test is >50%
 3 - Prevalence Index is $\leq 3.0^1$
 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
 Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

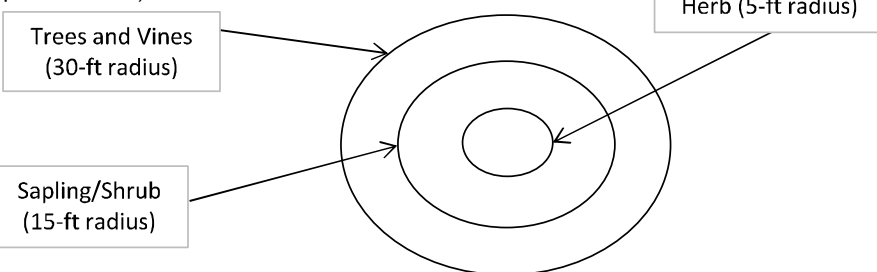
Sapling /Shrub - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present?Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)



Project/Site: I-64 /High Rise Bridge Corridor Study

Sampling date: 2/6/2014

Sampling point: WL-7

Soil**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-5	10YR 3/1	100					fine sandy loam	wet
5-9	10YR 4/1	100					sand	wet
9-16+	10YR 5/1	100					sand	wet

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks: no odors observed

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 10/28/2013
 Applicant/Owner: VDOT State: VA Sampling Point: WL-8
 Investigator(s): David Kwasneiwski and Glenn Wilson Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): none Slope (%): 0-0.5%
 Subregion (LRR or MLRA): LRR T Lat: 36° 46' 16.27" Long: 76° 21' 42.18" Datum: WGS 84
 Soil Map Unit Name: Tomotley-Deloss complex NWI classification: PFO1C
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Remarks: PFO Wetland Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location) Wetland is located northeast of I-64 without a tidal influence	

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply) <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Marl Deposits (B15) (LRR U) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Recent Reduction in Tilled Soils (C6) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input checked="" type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input checked="" type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)

Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes _____ No <u>X</u> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
--	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Sampling date: 10/28/2013
Sampling point: WL-8

Tree Stratum (Plot sizes: ft)		Absolute % Cover	Dominant Species?	Indicator Status
1.	<i>Acer rubrum</i> Red Maple	40	Y	FAC
2.	<i>Liquidambar styraciflua</i> Sweet-Gum	20	Y	FAC
3.	<i>Quercus nigra</i> Water Oak	10	N	FAC
4.	<i>Nyssa sylvatica</i> Black Tupelo	5	N	FAC
Total Cover: 75		50% of total cover 20% of total cover	38% 15%	

Number of Dominant species That are OBL, FACW, or FAC:	3	(A)
---	---	-----

Total number of Dominant Species across All Strata:	3	(B)
---	---	-----

Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)

<u>Total % Cover of</u>	<u>Multiply by:</u>	
OBL species _____	x 1 = _____	
FACW species _____	x 2 = _____	
FAC species _____	x 3 = _____	
FACU species _____	x 4 = _____	
UPL species _____	x 5 = _____	
Column Totals: _____	(A) _____	(B) _____
Prevalence Index = B/A = _____		

	1 - Rapid Test for Hydrophytic Vegetation
X	2 - Dominance Test is >50%
	3 - Prevalence Index is $\leq 3.0^1$
	4 - Morphological Adaptations ¹ (Provide supporting data and Remarks or on a separate sheet)
	Problematic Hydrophytic Vegetation ¹ (Explain)

Indicators of hydric soil and wetland hydrology must be present

Tree - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling /Shrub - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine - All woody vines greater than 3.28 ft in height.

Present?	Yes	X	No
----------	-----	---	----

Sapling /Shrub Stratum (ft)				
1.	<i>Clethra alnifolia</i> Coastal Sweet-Pepperbush	60	Y	FACW
2.	<i>Vaccinium corymbosum</i> Highbush Blueberry	15	N	FACW
3.	<i>Magnolia virginiana</i> Sweet-Bay	5	N	FACW
4.				
5.				
Total Cover: 80		50% of total cover	40%	
		20% of total cover	16%	

Herb Stratum	()			
1.				
2.				
3.				
4.				
5.				
6.				
Total Cover:	0	50% of total cover	0%	
		20% of total cover	0%	

Woody Vine Stratum ()				
1.				
2.				
3.				
4.				
Total Cover:		0	50% of total cover	0%
			20% of total cover	0%

A diagram showing three concentric circles representing different vegetation zones. The innermost circle is labeled 'Herb (5-ft radius)'. The middle circle is labeled 'Sapling/Shrub (15-ft radius)'. The outermost circle is labeled 'Trees and Vines (30-ft radius)'. Arrows point from each text label to its corresponding circle.

Soil**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-1	5YR 2.5/2	90	10YR 3/3	10			loam	
1-11	7.5YR 2.5/1	100					sandy loam	fine
11-15	7.5YR 3/1	100					sandy loam	fine, some clay
15-21	7.5YR 4/1	100					sandy clay loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks:

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 11/11/2013
 Applicant/Owner: VDOT State: VA Sampling Point: WL-9
 Investigator(s): David Kwasneiwski and Glenn Wilson Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): none Slope (%): 0-0.5%
 Subregion (LRR or MLRA): LRR T Lat: 36° 45' 43.28" Long: 76° 21' 29.41" Datum: WGS 84
 Soil Map Unit Name: Tomotley-Urban land-Nimmo complex NWI classification: N/A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Remarks: PFO Wetland Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location) Wetland is located in the median of I-64 without a tidal influence	

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Shallow Aquitard (D3)
<input checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
	<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)

Field Observations:					
Surface Water Present?	Yes _____ No <u>X</u>	Depth (inches):	<u>-</u>		
Water Table Present?	Yes _____ No <u>X</u>	Depth (inches):	<u>-</u>		
Saturation Present?	Yes <u>X</u> No _____	Depth (inches):	<u>2"</u>		
(includes capillary fringe)				Wetland Hydrology Present? Yes <u>X</u> No _____	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 11/11/2013Sampling point: WL-9**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer rubrum</u> Red Maple	<u>40</u>	<u>Y</u>	<u>FAC</u>
2. <u>Liquidambar styraciflua</u> Sweet-Gum	<u>10</u>	<u>Y</u>	<u>FAC</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: <u>50</u>	50% of total cover 20% of total cover	25% 10%	_____

Dominance Test worksheet:Number of Dominant species
That are OBL, FACW, or FAC: 7 (A)Total number of Dominant
Species across All Strata: 7 (B)Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)**Prevalence Index worksheet:**

Total % Cover of Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- x 2 - Dominance Test is >50%
- 3 - Prevalence Index is $\leq 3.0^1$
- 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

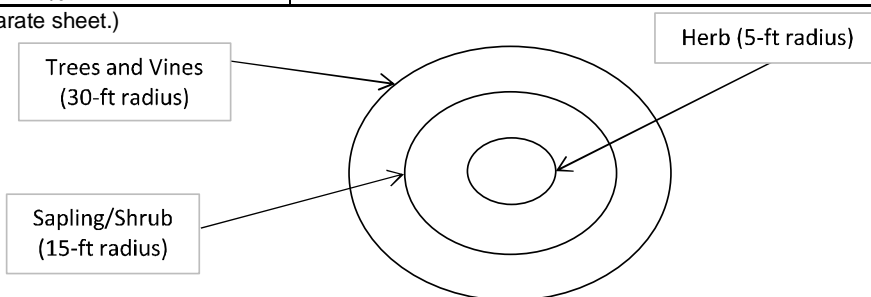
¹Indicators of hydric soil and wetland hydrology must be present**Definitions of Four Vegetation Strata:****Tree** - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.**Sapling /Shrub** - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.**Woody Vine** - All woody vines greater than 3.28 ft in height.**Hydrophytic Vegetation**Present? Yes X No _____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer rubrum</u> Red Maple	<u>20</u>	<u>Y</u>	<u>FAC</u>
2. <u>Liquidambar styraciflua</u> Sweet-Gum	<u>10</u>	<u>Y</u>	<u>FAC</u>
3. <u>Ulmus americana</u> American Elm	<u>3</u>	<u>N</u>	<u>FAC</u>
4. <u>Quercus palustris</u> Pin Oak	<u>3</u>	<u>N</u>	<u>FACW</u>
5. _____	_____	_____	_____
Total Cover: <u>36</u>	50% of total cover 20% of total cover	18% 7%	_____

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Juncus effusus</u> Lamp Rush	<u>20</u>	<u>Y</u>	<u>OBL</u>
2. <u>Arundinaria gigantea</u> Giant Cane	<u>5</u>	<u>Y</u>	<u>FACW</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
Total Cover: <u>25</u>	50% of total cover 20% of total cover	13% 5%	_____

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Campsis radicans</u> Trumpet-Creeper	<u>5</u>	<u>Y</u>	<u>FAC</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: <u>5</u>	50% of total cover 20% of total cover	3% 1%	_____

Remarks: (Include photo numbers here or on a separate sheet.)



Project/Site: I-64 /High Rise Bridge Corridor Study

Sampling date: 11/11/2013

Sampling point: WL-9

Soil

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	7.5YR 2.5/1	100					silt loam	organic layer moist
2-14	10YR 3/2	100					fine sandy loam	wet
14+	10YR 3/2	100					sandy clay loam	hard layer wet

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

Indicators for Problematic Hydric Soils³:

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks:

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 2/7/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-11
 Investigator(s): David Kwasneiwski and Glenn Wilson Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 45' 33.94" Long: 76° 20' 35.71" Datum: WGS 84
 Soil Map Unit Name: Udorthents-Urban land complex NWI classification: N/A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	
Remarks: PFO Wetland Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location) This wetland is located to the north of I-64 without a tidal influence			

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)		
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)	<input checked="" type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input checked="" type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Reduction in Tilled Soils (C6)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input checked="" type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input type="checkbox"/> Shallow Aquitard (D3)
<input checked="" type="checkbox"/> Water-Stained Leaves (B9)		<input type="checkbox"/> FAC-Neutral Test (D5)
		<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)

Field Observations:				Wetland Hydrology Present? Yes <u>X</u> No _____
Surface Water Present?	Yes _____ No <u>X</u>	Depth (inches):	_____ -	
Water Table Present?	Yes <u>X</u> No _____	Depth (inches):	_____ 0"	
Saturation Present?	Yes <u>X</u> No _____	Depth (inches):	_____ 0"	
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:				

Remarks:

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/7/2014Sampling point: WL-11**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Liquidambar styraciflua</u> Sweet-Gum	25	Y	FAC
2. <u>Acer rubrum</u> Red maple	10	Y	FAC
3. <u>Ulmus americana</u> American elm	5	N	FAC
4. _____	_____	_____	_____
Total Cover: 40	50% of total cover 20% of total cover	20% 8%	_____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Liquidambar styraciflua</u> Sweet-Gum	10	Y	FAC
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 10	50% of total cover 20% of total cover	5% 2%	_____

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Dominance Test worksheet:Number of Dominant species
That are OBL, FACW, or FAC: 3 (A)Total number of Dominant
Species across All Strata: 3 (B)Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)**Prevalence Index worksheet:**

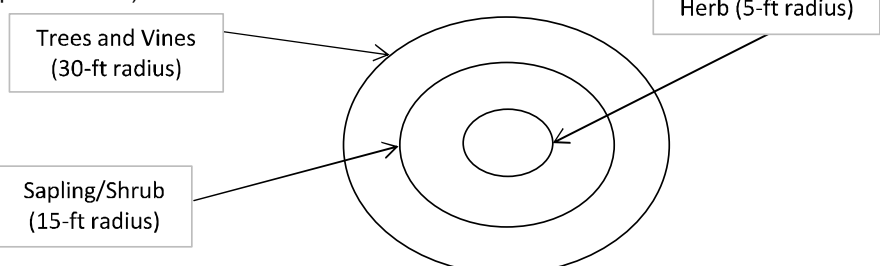
Total % Cover of	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____	(A) _____ (B) _____
Prevalence Index = B/A = _____	

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
 x 2 - Dominance Test is >50%
 3 - Prevalence Index is $\leq 3.0^1$
 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
 Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present**Definitions of Four Vegetation Strata:****Tree** - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.**Sapling /Shrub** - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.**Woody Vine** - All woody vines greater than 3.28 ft in height.**Hydrophytic Vegetation**Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)



Project/Site: I-64 /High Rise Bridge Corridor Study

Sampling date: 2/7/2014

Sampling point: WL-11

Soil**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	10YR 3/1	100					fine sandy loam	
4-8	10YR 6/2	80	10YR 5/4	20			fine sandy loam	
8-12	10YR 6/1	90	7.5YR 4/4	10			clay	
12-16+	7.5YR 5/1	100					sandy clay	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input checked="" type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks:

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 2/6/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-12, 13
 Investigator(s): David Kwasneiwski and Glenn Wilson Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 45' 35.59" Long: 76° 19' 49.38" Datum: WGS 84
 Soil Map Unit Name: Nawney silt loam NWI classification: E2EM1P
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	
Remarks: Tidal E2EM5 Wetland (<i>Phragmites australis</i> dominant) Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location) This wetland is located to the north of I-64 within tidal waters			

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)		
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)	<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Reduction in Tilled Soils (C6)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input checked="" type="checkbox"/> Water-Stained Leaves (B9)		<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)

Field Observations:				Wetland Hydrology Present? Yes <u>X</u> No _____
Surface Water Present?	Yes _____ No <u>X</u>	Depth (inches):	-	
Water Table Present?	Yes <u>X</u> No _____	Depth (inches):	3"	
Saturation Present?	Yes <u>X</u> No _____	Depth (inches):	3"	
(includes capillary fringe)				

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/6/2014
Sampling point: WL-12, 13**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Phragmites australis</u>	95	Y	FACW
Common reed			
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
Total Cover: 95	50% of total cover 20% of total cover	48% 19%	_____

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Dominance Test worksheet:

Number of Dominant species
That are OBL, FACW, or FAC: 1 (A)

Total number of Dominant
Species across All Strata: 1 (B)

Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

<u>Total % Cover of</u>	<u>Multiply by:</u>
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____	(A) _____ (B) _____
Prevalence Index = B/A = _____	

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
 x 2 - Dominance Test is >50%
 3 - Prevalence Index is $\leq 3.0^1$
 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
 Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling /Shrub - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.

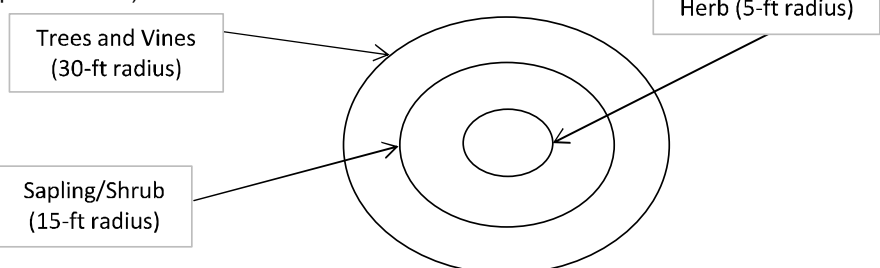
Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present?

Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)



Project/Site: I-64 /High Rise Bridge Corridor Study

Sampling date: 2/6/2014

Sampling point: WL-12, 13

Soil**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-6	10YR 3/3	100					silt loam	root mat
6-10	10YR 7/1	90	10YR 5/6	10			sand	
10-16+	10YR 6/1	100					sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input checked="" type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks: no odor observed, organic streaking was observed from 6"+

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 2/7/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-14, 15
 Investigator(s): David Kwasneiwski and Glenn Wilson Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 45' 31.57" Long: 76° 19' 45.67" Datum: WGS 84
 Soil Map Unit Name: Munden-Urban land complex and Water NWI classification: E2EM1P
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	
Remarks: Tidal E2EM Wetland Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location) This wetland is located to the south of I-64 within tidal waters			

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)		
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)	<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Crayfish Burrows (C8)
<input checked="" type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Reduction in Tilled Soils (C6)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input checked="" type="checkbox"/> Water-Stained Leaves (B9)		<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)

Field Observations:				Wetland Hydrology Present? Yes <u>X</u> No _____
Surface Water Present?	Yes _____	No <u>X</u>	Depth (inches): _____	
Water Table Present?	Yes <u>X</u>	No _____	Depth (inches): <u>0"</u>	
Saturation Present?	Yes <u>X</u>	No _____	Depth (inches): <u>0"</u>	
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:				

Remarks:

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/7/2014
Sampling point: WL-14, 15**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Spartina alterniflora</u>	70	Y	OBL
<u>Saltwater Cord Grass</u>			
2. <u>Phragmites australis</u>	20	Y	FACW
<u>Common reed</u>			
3. <u>Spartina cynosuroides</u>	5	N	OBL
<u>Big Cord Grass</u>			
4. _____			
5. _____			
6. _____			
Total Cover: 95	50% of total cover 20% of total cover	48% 19%	_____

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Dominance Test worksheet:

Number of Dominant species
That are OBL, FACW, or FAC: 2 (A)

Total number of Dominant
Species across All Strata: 2 (B)

Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- x 2 - Dominance Test is >50%
- 3 - Prevalence Index is $\leq 3.0^1$
- 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling /Shrub - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.

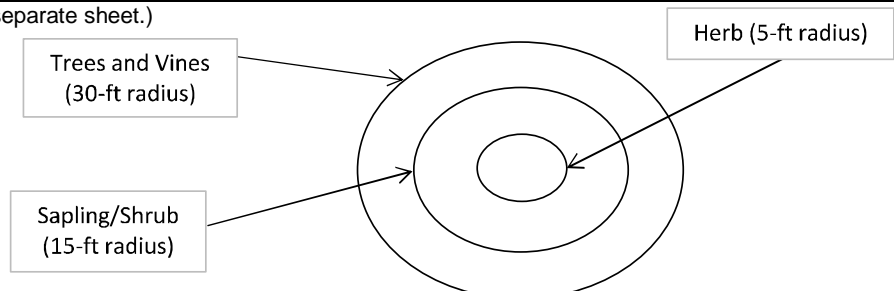
Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present?

Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)



Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/7/2014Sampling point: WL-14, 15**Soil****Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-6	10YR 3/1	100					fine sandy loam	many roots, root mat
6-9	10YR 4/1	100					fine sandy loam	
9-16+	10YR 5/1	100					sand	fine

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Stratified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks:

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 2/6/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-16, 17, 18
 Investigator(s): David Kwasneiwski and Glenn Wilson Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 45' 35.61" Long: 76° 19' 40.05" Datum: WGS 84
 Soil Map Unit Name: Munden-Urban land complex and Water NWI classification: E1UBLx
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	

Remarks: Tidal E2EM5 Wetland (*Phragmites australis* dominant)
 Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location)
 This wetland is located to the north of I-64 within tidal waters

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)		
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input checked="" type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Reduction in Tilled Soils (C6)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input type="checkbox"/> Shallow Aquitard (D3)
<input checked="" type="checkbox"/> Water-Stained Leaves (B9)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
		<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)

Field Observations:				Wetland Hydrology Present? Yes <u>X</u> No _____
Surface Water Present?	Yes _____ No <u>X</u>	Depth (inches):	_____ -	
Water Table Present?	Yes <u>X</u> No _____	Depth (inches):	_____ 3"	
Saturation Present?	Yes <u>X</u> No _____	Depth (inches):	_____ 3"	

(includes capillary fringe)

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/6/2014Sampling point: WL-16, 17, 18**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Baccharis halimifolia</u>	2	Y	FAC
Groundsel tree	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 2	50% of total cover 20% of total cover	1% 0%	_____

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Phragmites australis</u>	70	Y	FACW
Common reed	_____	_____	_____
2. <u>Spartina cynosuroides</u>	30	Y	OBL
Big Cord Grass	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
Total Cover: 100	50% of total cover 20% of total cover	50% 20%	_____

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Dominance Test worksheet:Number of Dominant species
That are OBL, FACW, or FAC: 3 (A)Total number of Dominant
Species across All Strata: 3 (B)Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)**Prevalence Index worksheet:**

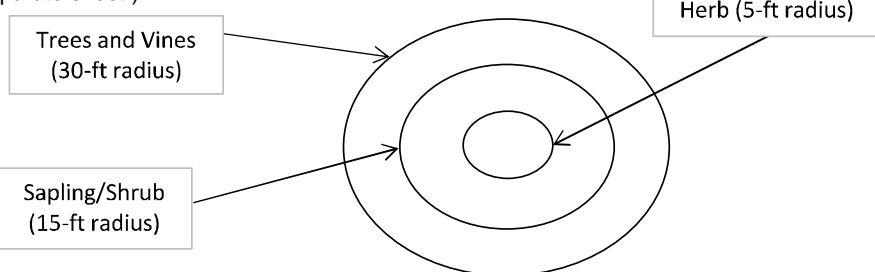
Total % Cover of	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____	(A) _____ (B) _____
Prevalence Index = B/A = _____	

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
 x 2 - Dominance Test is >50%
 3 - Prevalence Index is $\leq 3.0^1$
 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
 Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present**Definitions of Four Vegetation Strata:****Tree** - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.**Sapling /Shrub** - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.**Woody Vine** - All woody vines greater than 3.28 ft in height.**Hydrophytic Vegetation Present?**Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)



Project/Site: I-64 /High Rise Bridge Corridor Study

Sampling date: 2/6/2014

Sampling point: WL-16, 17, 18

Soil**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	10YR 3/2	100					loam	
3-10	10YR 4/1	100					sandy loam	
10-16+	10YR 5/1	100					loamy sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks: no odor observed

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: <u>I-64 /High Rise Bridge Corridor Study</u>		City/County: <u>City of Chesapeake</u>	Sampling Date: <u>2/6/2014</u>
Applicant/Owner: <u>VDOT</u>		State: <u>VA</u>	Sampling Point: <u>WL-19</u>
Investigator(s): <u>David Kwasniewski and Glenn Wilson</u>		Section, Township, Range: _____	
Landform (hillslope, terrace, etc.): <u>Toe of slope</u>		Local relief (concave, convex, none): <u>none</u>	Slope (%): <u>0-1%</u>
Subregion (LRR or MLRA): <u>LRR T</u>	Lat: <u>36° 45' 35.97"</u>	Long: <u>76° 19' 37.83"</u>	Datum: <u>WGS 84</u>
Soil Map Unit Name: <u>Munden-Urban land complex</u>		NWI classification: <u>N/A</u>	
Are climatic / hydrologic conditions on the site typical for this time of year? Yes <u>X</u> No _____ (If no, explain in Remarks.)			
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed?		Are "Normal Circumstances" present? Yes <u>X</u> No _____	
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)			

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Remarks: PEM5 Wetland adjacent to roadside ditch (<i>Phragmites australis</i> dominant) Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location) Wetland is located north of I-64 with a tidal influence	

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	
<input checked="" type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Aquatic Fauna (B13) <input checked="" type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Marl Deposits (B15) (LRR U) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Recent Reduction in Tilled Soils (C6) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input checked="" type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input checked="" type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)

Field Observations: Surface Water Present? Yes <u>X</u> No _____ Depth (inches): <u>2"</u> Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>0"</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>0"</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
--	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Data recorded in February, with over 0.5" of precip in the previous week.

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/6/2014Sampling point: WL-19**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Phragmites australis</u> common reed	90	Y	FACW
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
Total Cover: 90	50% of total cover 20% of total cover	45% 18%	_____

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Lonicera japonica</u> Japanese honeysuckle	30	Y	FAC
2. <u>Smilax rotundifolia</u> greenbriar	5	N	FAC
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 35	50% of total cover 20% of total cover	18% 7%	_____

Dominance Test worksheet:

Number of Dominant species
That are OBL, FACW, or FAC: 2 (A)

Total number of Dominant
Species across All Strata: 2 (B)

Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____	(A) _____ (B) _____
Prevalence Index = B/A = _____	

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
x 2 - Dominance Test is >50%
3 - Prevalence Index is $\leq 3.0^1$
4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

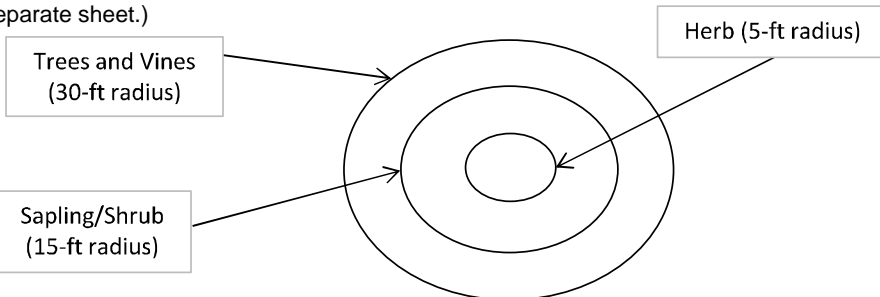
Sapling /Shrub - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present?Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)



Project/Site: I-64 /High Rise Bridge Corridor Study

Sampling date: 2/6/2014

Sampling point: WL-19

Soil**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	10YR 3/1	100					fine sandy loam	wet
3-10	10YR 3/1	100					sandy loam	wet
10-16+	10YR 3/2	100					sandy loam	wet

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks: no odors observed
potential fill material observed
redox concentrations likely masked by wet soils with potential fill materials

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 2/6/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-20
 Investigator(s): David Kwasneiwski and Glenn Wilson Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 45' 33.18" Long: 76° 19' 15.18" Datum: WGS 84
 Soil Map Unit Name: Udorthents-Urban land complex NWI classification: N/A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area Within a Wetland?	Yes <u>X</u>	No _____
Hydric Soil Present?	Yes <u>X</u>	No _____			
Wetland Hydrology Present?	Yes <u>X</u>	No _____			
Remarks: PFO Wetland Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location) This wetland is located to the south of I-64 without a tidal influence					

HYDROLOGY

Wetland Hydrology Indicators:				Secondary Indicators (minimum of two required)	
Primary Indicators (minimum of one is required; check all that apply)					
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Surface Soil Cracks (B6)			
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)	<input checked="" type="checkbox"/> Drainage Patterns (B10)			
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Moss Trim Lines (B16)			
<input checked="" type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Dry-Season Water Table (C2)			
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Crayfish Burrows (C8)			
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Reduction in Tilled Soils (C6)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)			
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Geomorphic Position (D2)			
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Shallow Aquitard (D3)			
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)			
<input checked="" type="checkbox"/> Water-Stained Leaves (B9)		<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)			

Field Observations:					
Surface Water Present?	Yes <u>X</u>	No _____	Depth (inches):	<u>0"</u>	Wetland Hydrology Present? Yes <u>X</u> No _____
Water Table Present?	Yes <u>X</u>	No _____	Depth (inches):	<u>0"</u>	
Saturation Present?	Yes <u>X</u>	No _____	Depth (inches):	<u>0"</u>	
(includes capillary fringe)					
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:					
Remarks: Water is at soil surface					

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/6/2014Sampling point: WL-20**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer rubrum</u> Red maple	50	Y	FAC
2. <u>Liquidambar styraciflua</u> Sweet-Gum	15	N	FAC
3. <u>Pinus taeda</u> Loblolly Pine	15	N	FAC
4. _____	_____	_____	_____
Total Cover: 80	50% of total cover 20% of total cover	40% 16%	_____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Herb Stratum (')	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Arundinaria gigantea</u> Giant cane	70	Y	FACW
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
Total Cover: 70	50% of total cover 20% of total cover	35% 14%	_____

Woody Vine Stratum (')	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Dominance Test worksheet:Number of Dominant species
That are OBL, FACW, or FAC: 2 (A)Total number of Dominant
Species across All Strata: 2 (B)Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)**Prevalence Index worksheet:**

Total % Cover of Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

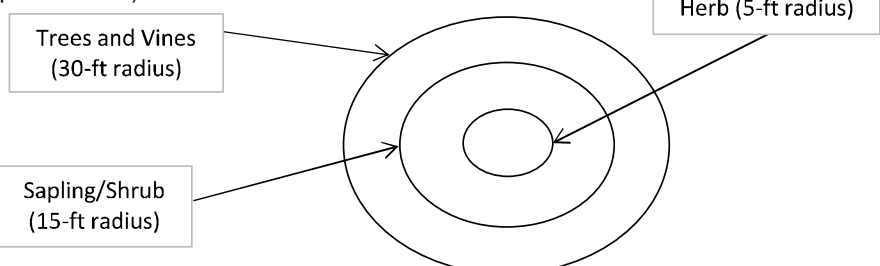
Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- x 2 - Dominance Test is >50%
- 3 - Prevalence Index is $\leq 3.0^1$
- 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present**Definitions of Four Vegetation Strata:****Tree** - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.**Sapling /Shrub** - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.**Woody Vine** - All woody vines greater than 3.28 ft in height.**Hydrophytic Vegetation Present?**Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)



Project/Site: I-64 /High Rise Bridge Corridor Study

Sampling date: 2/6/2014

Sampling point: WL-20

Soil**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	10YR 3/1	100					fine sandy loam	
3-8	10YR 5/1	90	5YR 5/6	10			fine sand	
8+	7.5YR 5/1	95	7.5YR 3/4	5			sandy clay loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks: no odor observed

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 2/3/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-21
 Investigator(s): Glenn Wilson and David Kwasniewski Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): tidal floodplain Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 45' 36.17" Long: 76° 19' 01.53" Datum: WGS 84
 Soil Map Unit Name: Nawney silt loam, Bojac loamy fine sand, Udorthents-Urban land complex, NWI classification: PEM1R
Tetotum fine sandy loam

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	
Remarks: Tidal E2EM Wetland Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location) This wetland is located to the north of I-64 within tidal waters			

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)		
<u>X</u> Surface Water (A1)	_____ Aquatic Fauna (B13)	_____ Surface Soil Cracks (B6)
<u>X</u> High Water Table (A2)	_____ Marl Deposits (B15) (LRR U)	_____ Sparsely Vegetated Concave Surface (B8)
<u>X</u> Saturation (A3)	<u>X</u> Hydrogen Sulfide Odor (C1)	<u>X</u> Drainage Patterns (B10)
<u>X</u> Water Marks (B1)	_____ Oxidized Rhizospheres on Living Roots (C3)	_____ Moss Trim Lines (B16)
_____ Sediment Deposits (B2)	_____ Presence of Reduced Iron (C4)	_____ Dry-Season Water Table (C2)
<u>X</u> Drift Deposits (B3)	_____ Recent Reduction in Tilled Soils (C6)	_____ Crayfish Burrows (C8)
_____ Algal Mat or Crust (B4)	_____ Thin Muck Surface (C7)	_____ Saturation Visible on Aerial Imagery (C9)
_____ Iron Deposits (B5)	_____ Other (Explain in Remarks)	<u>X</u> Geomorphic Position (D2)
<u>X</u> Inundation Visible on Aerial Imagery (B7)		_____ Shallow Aquitard (D3)
<u>X</u> Water-Stained Leaves (B9)		<u>X</u> FAC-Neutral Test (D5)
		_____ Sphagnum moss (D8) (LRR T, U)

Field Observations:				Wetland Hydrology Present? Yes <u>X</u> No _____
Surface Water Present?	Yes <u>X</u> No _____	Depth (inches):	<u>3"</u>	
Water Table Present?	Yes <u>X</u> No _____	Depth (inches):	<u>0"</u>	
Saturation Present?	Yes <u>X</u> No _____	Depth (inches):	<u>0"</u>	
(includes capillary fringe)				

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/3/2014Sampling point: WL-21**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0 50% of total cover 0% 0%			

Dominance Test worksheet:Number of Dominant species That are OBL, FACW, or FAC: 1 (A)Total number of Dominant Species across All Strata: 1 (B)Percent of Dominant Species That are OBL, FACW, or FAC: 100% (A/B)**Prevalence Index worksheet:**

Total % Cover of Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is $\leq 3.0^1$
- ☐ 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

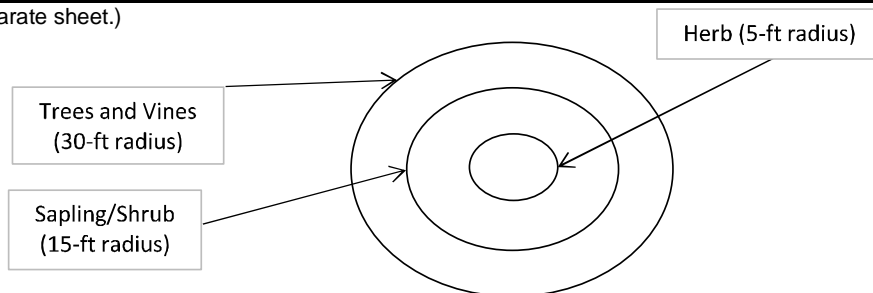
¹Indicators of hydric soil and wetland hydrology must be present**Definitions of Four Vegetation Strata:****Tree** - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.**Sapling /Shrub** - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.**Woody Vine** - All woody vines greater than 3.28 ft in height.**Hydrophytic Vegetation Present?**Yes X No _____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 0 50% of total cover 0% 0%			

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Spartina alterniflora</u>	<u>65</u>	<u>Y</u>	<u>OBL</u>
<u>Saltwater Cord Grass</u>			
2. <u>Phragmites australis</u>	<u>15</u>	<u>N</u>	<u>FACW</u>
<u>Common Reed</u>			
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
Total Cover: 80 50% of total cover 40% 16%			

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0 50% of total cover 0% 0%			

Remarks: (Include photo numbers here or on a separate sheet.)



Project/Site: I-64 /High Rise Bridge Corridor Study

Sampling date: 2/3/2014

Sampling point: WL-21

Soil**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-5	10YR 3/1	100					silt loam	saturated
5-12	10YR 4/1	100					fine sandy loam	saturated

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Stratified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks: Many roots down to 8" below soil surface, soil was very saturated, Redox features could not be seen due to saturation.

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 2/3/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-22,25,26,27
 Investigator(s): Glenn Wilson and David Kwasniewski Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): tidal floodplain Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 45' 37.90" Long: 76° 18' 47.67" Datum: WGS 84
 Soil Map Unit Name: Rappahannock muck, Pocatuy mucky peat, Udorthents-Urban land complex NWI classification: E2EM1P
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area Within a Wetland?
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	
Yes <u>X</u> No _____			

Remarks: Tidal E2EM Wetland (lower tidal)
 Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location)
 This wetland is located to the north of I-64 within tidal waters

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)		
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Reduction in Tilled Soils (C6)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input checked="" type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input checked="" type="checkbox"/> Shallow Aquitard (D3)
<input checked="" type="checkbox"/> Water-Stained Leaves (B9)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
		<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)

Field Observations:				Wetland Hydrology Present?
Surface Water Present?	Yes <u>X</u>	No _____	Depth (inches): <u>3"</u>	
Water Table Present?	Yes <u>X</u>	No _____	Depth (inches): <u>0"</u>	
Saturation Present?	Yes <u>X</u>	No _____	Depth (inches): <u>0"</u>	
(includes capillary fringe)				Yes <u>X</u> No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/3/2014Sampling point: WL-22,25,26,27**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____
Sapling /Shrub Stratum (ft)			
1. <u>Baccharis halimifolia</u>	3	Y	FAC
Groundseltree	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 3	50% of total cover 20% of total cover	2% 1%	_____
Herb Stratum ()			
1. <u>Spartina patens</u>	80	Y	FACW
Salt-Meadow Cord Grass	_____	_____	_____
2. <u>Aster spp.</u>	10	N	FAC
3. <u>Phragmites australis</u>	3	N	FACW
Common Reed	_____	_____	_____
4. <u>Spartina alterniflora</u>	3	N	OBL
Saltwater Cord Grass	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
Total Cover: 96	50% of total cover 20% of total cover	48% 19%	_____
Woody Vine Stratum ()			
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Dominance Test worksheet:Number of Dominant species
That are OBL, FACW, or FAC: 2 (A)Total number of Dominant
Species across All Strata: 2 (B)Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)**Prevalence Index worksheet:**

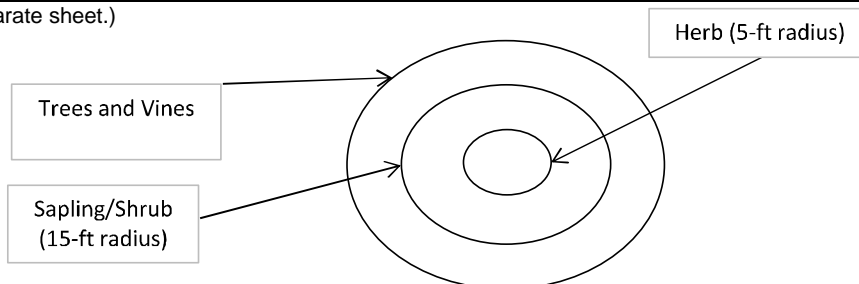
Total % Cover of	Multiply by:
OBL species	x 1 = _____
FACW species	x 2 = _____
FAC species	x 3 = _____
FACU species	x 4 = _____
UPL species	x 5 = _____
Column Totals:	_____ (A) _____ (B)
Prevalence Index = B/A =	_____

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
☒ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is $\leq 3.0^1$
☐ 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
 Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present**Definitions of Four Vegetation Strata:****Tree** - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.**Sapling /Shrub** - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.**Woody Vine** - All woody vines greater than 3.28 ft in height.**Hydrophytic Vegetation Present?**Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)



Project/Site: I-64 /High Rise Bridge Corridor Study

Sampling date: 2/3/2014

Sampling point: WL-22,25,26,27

Soil**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	10YR 3/2	100					loamy sand	
2-12+	10YR 3/1	100					fine sandy loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks: Loamy sand at 12"+ below soil surface, soil was very saturated at 3" below soil surface, Redox features could not be seen due to saturation.

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 2/3/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-23
 Investigator(s): Glenn Wilson and David Kwasniewski Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): tidal floodplain Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 45' 35.32" Long: 76° 18' 51.10" Datum: WGS 84
 Soil Map Unit Name: Bojac-Urban land-Wando complex NWI classification: E2EM1P and PFO1R
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	

Remarks: Tidal E2EM5 Wetland (*Phragmites australis* dominant)
 Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location)
 This wetland is located to the north of I-64 within tidal waters

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)		
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Reduction in Tilled Soils (C6)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input checked="" type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input checked="" type="checkbox"/> Shallow Aquitard (D3)
<input checked="" type="checkbox"/> Water-Stained Leaves (B9)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
		<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)

Field Observations:				Wetland Hydrology Present? Yes <u>X</u> No _____
Surface Water Present?	Yes _____ No <u>X</u>	Depth (inches):	-	
Water Table Present?	Yes <u>X</u> No _____	Depth (inches):	4"	
Saturation Present?	Yes <u>X</u> No _____	Depth (inches):	4"	

(includes capillary fringe)

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/3/2014Sampling point: WL-23**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Liquidambar styraciflua</u> Sweet-Gum	<u>2</u>	<u>Y</u>	<u>FAC</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: <u>2</u>	50% of total cover 20% of total cover	1% 0%	_____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Morella cerifera</u> Southern Bayberry	<u>5</u>	<u>Y</u>	<u>FAC</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: <u>5</u>	50% of total cover 20% of total cover	3% 1%	_____

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Phragmites australis</u> Common Reed	<u>80</u>	<u>Y</u>	<u>FACW</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
Total Cover: <u>80</u>	50% of total cover 20% of total cover	40% 16%	_____

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: <u>0</u>	50% of total cover 20% of total cover	0% 0%	_____

Dominance Test worksheet:Number of Dominant species
That are OBL, FACW, or FAC: 3 (A)Total number of Dominant
Species across All Strata: 3 (B)Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)**Prevalence Index worksheet:**

Total % Cover of Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

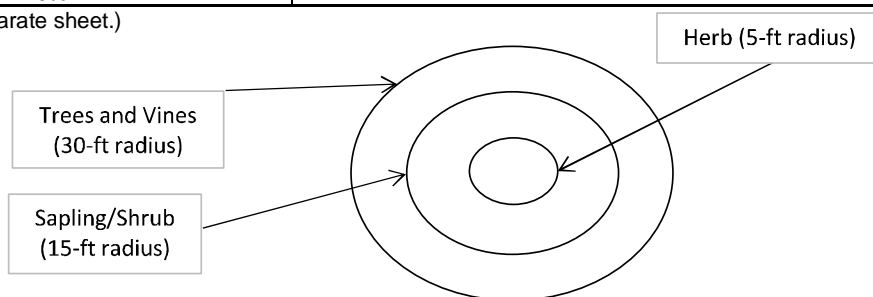
Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- x 2 - Dominance Test is >50%
- 3 - Prevalence Index is ≤ 3.0 ¹
- 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present**Definitions of Four Vegetation Strata:****Tree** - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.**Sapling /Shrub** - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.**Woody Vine** - All woody vines greater than 3.28 ft in height.**Hydrophytic Vegetation Present?**Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)



Project/Site: I-64 /High Rise Bridge Corridor Study

Sampling date: 2/3/2014

Sampling point: WL-23

Soil**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	10YR 3/1	100					sandy loam	
2-9	10YR 4/1	100					sand	medium grain
9+	10YR 4/1	80	10YR 3/3	20			loamy sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks: Many roots from 0-2" below soil surface, soil was very saturated at 4" below soil surface, Redox features could not be seen due to saturation.

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 2/3/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-24
 Investigator(s): Glenn Wilson and David Kwasniewski Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): tidal floodplain Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 45' 35.66" Long: 76° 18' 47.77" Datum: WGS 84
 Soil Map Unit Name: Munden-Urban land-Pactolus complex NWI classification: PFO1R
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	
Remarks: Tidal E2EM5 Wetland (upper tidal) (<i>Phragmites australis</i> dominant) Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location) This wetland is located to the north of I-64 within tidal waters			

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Shallow Aquitard (D3)
<input checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)
<input type="checkbox"/> Marl Deposits (B15) (LRR U)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): <u>-</u> Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>5"</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>5"</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
---	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/3/2014Sampling point: WL-24**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Dominance Test worksheet:

Number of Dominant species
That are OBL, FACW, or FAC: 4 (A)

Total number of Dominant
Species across All Strata: 5 (B)

Percent of Dominant Species
That are OBL, FACW, or FAC: 80% (A/B)

Prevalence Index worksheet:

Total % Cover of Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is $\leq 3.0^1$
- ☐ 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling /Shrub - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present?

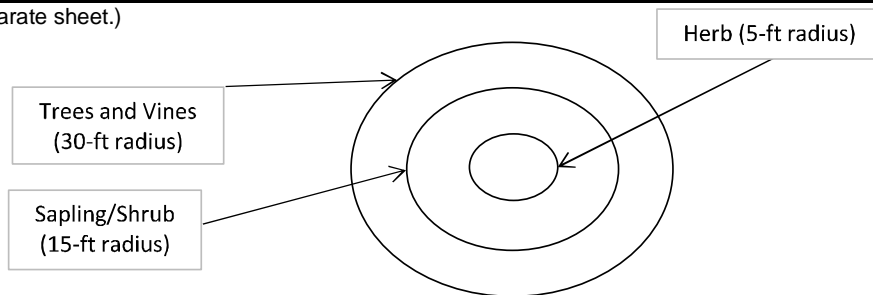
Yes X No _____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Baccharis halimifolia</u>	<u>15</u>	<u>Y</u>	<u>FAC</u>
2. <u>Groundsel tree</u>	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 15	50% of total cover 20% of total cover	8% 3%	_____

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Phragmites australis</u>	<u>50</u>	<u>Y</u>	<u>FACW</u>
2. <u>Common Reed</u>	_____	_____	_____
3. <u>Iva frutescens</u>	<u>20</u>	<u>Y</u>	<u>FACW</u>
4. <u>Jesuit's-Bark</u>	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
Total Cover: 70	50% of total cover 20% of total cover	35% 14%	_____

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Smilax rotundifolia</u>	<u>5</u>	<u>Y</u>	<u>FAC</u>
2. <u>Horsebrier</u>	_____	_____	_____
3. <u>Lonicera japonica</u>	<u>2</u>	<u>Y</u>	<u>FACU</u>
4. <u>Limber Honeysuckle</u>	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
Total Cover: 7	50% of total cover 20% of total cover	4% 1%	_____

Remarks: (Include photo numbers here or on a separate sheet.)



Soil**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	10YR 2/1	100					loam	
3-7	10YR 3/1	100					loamy sand	
7-9	10YR 6/2	100					sand	
9-12+	10YR 7/2	100					sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks:

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 2/3/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-28
 Investigator(s): Glenn Wilson and David Kwasniewski Section, Township, Range: _____ east side of wetland
 Landform (hillslope, terrace, etc.): tidal floodplain Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 45' 30.77" Long: 76° 18' 46.01" Datum: WGS 84
 Soil Map Unit Name: Pocaty mucky peat and Munden-Urban land-Pactolus complex NWI classification: E2EM1P and PFO1R
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	
Remarks: Tidal E2EM Wetland Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location) This wetland is located to the south of I-64 within tidal waters East side of wetland			

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)		
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Reduction in Tilled Soils (C6)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input checked="" type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input checked="" type="checkbox"/> Shallow Aquitard (D3)
<input checked="" type="checkbox"/> Water-Stained Leaves (B9)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
		<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)

Field Observations:			
Surface Water Present?	Yes _____ No <u>X</u>	Depth (inches): _____	Wetland Hydrology Present? Yes <u>X</u> No _____
Water Table Present?	Yes <u>X</u> No _____	Depth (inches): <u>0"</u>	
Saturation Present?	Yes <u>X</u> No _____	Depth (inches): <u>0"</u>	
(includes capillary fringe)			

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/3/2014Sampling point: WL-28**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Dominance Test worksheet:

Number of Dominant species
That are OBL, FACW, or FAC: 3 (A)

Total number of Dominant
Species across All Strata: 3 (B)

Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is $\leq 3.0^1$
- ☐ 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling /Shrub - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine - All woody vines greater than 3.28 ft in height.

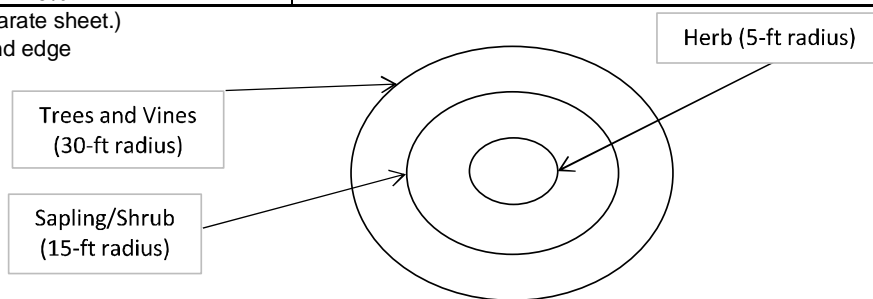
Hydrophytic Vegetation Present?Yes X No _____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Baccharis halimifolia</u>	<u>2</u>	<u>Y</u>	<u>FAC</u>
2. <u>Groundsel tree</u>	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 2	50% of total cover 20% of total cover	1% 0%	_____

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Spartina alterniflora</u>	<u>75</u>	<u>Y</u>	<u>OBL</u>
2. <u>Saltwater Cord Grass</u>	_____	_____	_____
3. <u>Juncus roemerianus</u>	<u>25</u>	<u>Y</u>	<u>OBL</u>
4. <u>Roemer's Rush</u>	_____	_____	_____
5. <u>Phragmites australis</u>	<u>10</u>	<u>N</u>	<u>FACW</u>
6. <u>Common Reed</u>	_____	_____	_____
Total Cover: 110	50% of total cover 20% of total cover	55% 22%	_____

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Remarks: (Include photo numbers here or on a separate sheet.)

Phragmites australis was observed along the wetland edge

Project/Site: I-64 /High Rise Bridge Corridor Study

Sampling date: 2/3/2014

Sampling point: WL-28

Soil**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-5	10YR 3/2	100					loam	many roots
5-16+	10YR 6/1	100					loamy sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input checked="" type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks:

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 2/3/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-28 west
 Investigator(s): Glenn Wilson and David Kwasniewski Section, Township, Range: _____ west side of wetland
 Landform (hillslope, terrace, etc.): tidal floodplain Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 45' 32.00" Long: 76° 19' 00.84" Datum: WGS 84
 Soil Map Unit Name: Pocaty mucky peat NWI classification: E2EM1P and PFO1R
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	
Remarks: Tidal E2EM Wetland Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location) This wetland is located to the south of I-64 within tidal waters Westside of wetland			

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)		
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Reduction in Tilled Soils (C6)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input type="checkbox"/> Shallow Aquitard (D3)
<input checked="" type="checkbox"/> Water-Stained Leaves (B9)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
		<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)

Field Observations:				Wetland Hydrology Present? Yes <u>X</u> No _____
Surface Water Present?	Yes _____ No <u>X</u>	Depth (inches):	-	
Water Table Present?	Yes <u>X</u> No _____	Depth (inches):	0"	
Saturation Present?	Yes <u>X</u> No _____	Depth (inches):	0"	
(includes capillary fringe)				

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/3/2014Sampling point: WL-28 west**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Dominance Test worksheet:Number of Dominant species
That are OBL, FACW, or FAC: 3 (A)Total number of Dominant
Species across All Strata: 3 (B)Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)**Prevalence Index worksheet:**

Total % Cover of Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is $\leq 3.0^1$
- ☐ 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

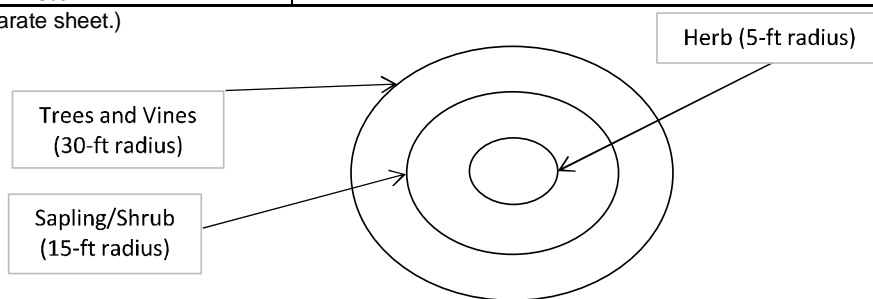
¹Indicators of hydric soil and wetland hydrology must be present**Definitions of Four Vegetation Strata:****Tree** - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.**Sapling /Shrub** - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.**Woody Vine** - All woody vines greater than 3.28 ft in height.**Hydrophytic Vegetation Present?**Yes ☒ No ☐

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Baccharis halimifolia</u>	<u>2</u>	<u>Y</u>	<u>FAC</u>
Groundsel tree	_____	_____	_____
2. <u>Morella cerifera</u>	<u>2</u>	<u>Y</u>	<u>FAC</u>
Southern Bayberry	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 4	50% of total cover 20% of total cover	2% 1%	_____

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Spartina alterniflora</u>	<u>90</u>	<u>Y</u>	<u>OBL</u>
Saltwater Cord Grass	_____	_____	_____
2. <u>Phragmites australis</u>	<u>5</u>	<u>N</u>	<u>FACW</u>
Common Reed	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
Total Cover: 95	50% of total cover 20% of total cover	48% 19%	_____

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Remarks: (Include photo numbers here or on a separate sheet.)



Project/Site: I-64 /High Rise Bridge Corridor Study

Sampling date: 2/3/2014

Sampling point: WL-28 west

Soil**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-16+	10YR 3/2	100					loamy sand	many roots

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Stratified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks: streaking was observed starting at 7"+

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 2/3/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-29, 30
 Investigator(s): Glenn Wilson and David Kwasniewski Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): tidal floodplain Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 45' 32.39" Long: 76° 19' 01.96" Datum: WGS 84
 Soil Map Unit Name: Pocaty mucky peat NWI classification: E2EM1P
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	
Remarks: Tidal E2EM Wetland Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location) This wetland is located to the south of I-64 within tidal waters			

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)		
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Reduction in Tilled Soils (C6)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input checked="" type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input checked="" type="checkbox"/> Shallow Aquitard (D3)
<input checked="" type="checkbox"/> Water-Stained Leaves (B9)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
		<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)

Field Observations:				Wetland Hydrology Present? Yes <u>X</u> No _____
Surface Water Present?	Yes <u>X</u>	No _____	Depth (inches): <u>2"</u>	
Water Table Present?	Yes <u>X</u>	No _____	Depth (inches): <u>0"</u>	
Saturation Present?	Yes <u>X</u>	No _____	Depth (inches): <u>0"</u>	
(includes capillary fringe)				

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/3/2014Sampling point: WL-29, 30**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Spartina alterniflora</u> Saltwater Cord Grass	50	Y	OBL
2. <u>Phragmites australis</u> Common Reed	30	Y	FACW
3. <u>Juncus roemerianus</u> Roemer's Rush	15	N	OBL
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
Total Cover: 95	50% of total cover 20% of total cover	48% 19%	_____

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Dominance Test worksheet:

Number of Dominant species
That are OBL, FACW, or FAC: 2 (A)

Total number of Dominant
Species across All Strata: 2 (B)

Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤ 3.0 ¹
- ☐ 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

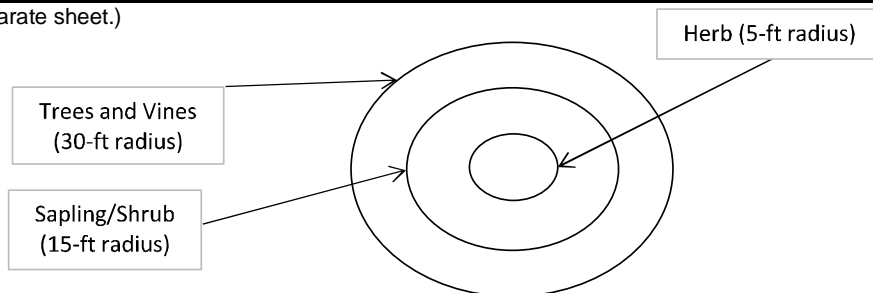
Sapling /Shrub - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present?Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)



Project/Site: I-64 /High Rise Bridge Corridor Study

Sampling date: 2/3/2014

Sampling point: WL-29, 30

Soil**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-12+	10YR 3/1	100					loam	many roots

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks:

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 2/3/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-31, 32
 Investigator(s): Glenn Wilson and David Kwasniewski Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): tidal floodplain Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 45' 39.10" Long: 76° 18' 20.33" Datum: WGS 84
 Soil Map Unit Name: Udorthents-Urban land complex NWI classification: E2EM1P and E2USN
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	
Remarks: Tidal E2EM Wetland Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location) This wetland is located to the north of I-64 within tidal waters This wetland is located adjacent to <i>Phragmites australis</i> dominant wetland			

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)		
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Reduction in Tilled Soils (C6)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input checked="" type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input checked="" type="checkbox"/> Shallow Aquitard (D3)
<input checked="" type="checkbox"/> Water-Stained Leaves (B9)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
		<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)

Field Observations:				Wetland Hydrology Present? Yes <u>X</u> No _____
Surface Water Present?	Yes _____ No <u>X</u>	Depth (inches):	_____ -	
Water Table Present?	Yes <u>X</u> No _____	Depth (inches):	_____ 0"	
Saturation Present?	Yes <u>X</u> No _____	Depth (inches):	_____ 0"	
(includes capillary fringe)				

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/3/2014Sampling point: WL-31, 32**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Dominance Test worksheet:Number of Dominant species
That are OBL, FACW, or FAC: 3 (A)Total number of Dominant
Species across All Strata: 3 (B)Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)**Prevalence Index worksheet:**

Total % Cover of Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is $\leq 3.0^1$
- ☐ 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

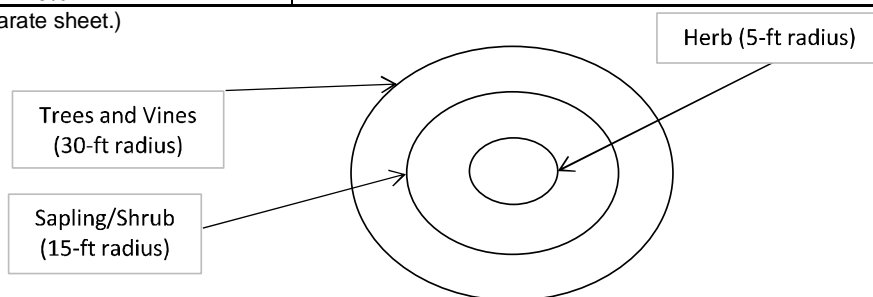
¹Indicators of hydric soil and wetland hydrology must be present**Definitions of Four Vegetation Strata:****Tree** - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.**Sapling /Shrub** - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.**Woody Vine** - All woody vines greater than 3.28 ft in height.**Hydrophytic Vegetation Present?**Yes X No _____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Spartina patens</u>	<u>80</u>	<u>Y</u>	<u>FACW</u>
<u>Salt-Meadow Cord Grass</u>			
2. <u>Juncus roemerianus</u>	<u>15</u>	<u>Y</u>	<u>OBL</u>
<u>Roemer's Rush</u>			
3. <u>Distichlis spicata</u>	<u>15</u>	<u>Y</u>	<u>OBL</u>
<u>Coastal Salt Grass</u>			
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
Total Cover: 110	50% of total cover 20% of total cover	55% 22%	_____

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Remarks: (Include photo numbers here or on a separate sheet.)



Project/Site: I-64 /High Rise Bridge Corridor Study

Sampling date: 2/3/2014

Sampling point: WL-31, 32

Soil**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	10YR 4/1	100					loam	many roots
4-12+	10YR 4/1	100					loam	few roots

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks: Soil saturated from the surface

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 2/3/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-33
 Investigator(s): Glenn Wilson and David Kwasniewski Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): tidal floodplain Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 45' 35.16" Long: 76° 18' 24.57" Datum: WGS 84
 Soil Map Unit Name: Udorthents-Urban land complex NWI classification: E2EM1P and PFO4S
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	

Remarks: Tidal E2EM5 Wetland (*Phragmites australis* dominant)
 Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location)
 This wetland is located to the north of I-64 within tidal waters
 Wetland is located in the upper tidal area

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)		
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Reduction in Tilled Soils (C6)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input checked="" type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input checked="" type="checkbox"/> Shallow Aquitard (D3)
<input checked="" type="checkbox"/> Water-Stained Leaves (B9)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
		<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)

Field Observations:				Wetland Hydrology Present? Yes <u>X</u> No _____
Surface Water Present?	Yes _____	No <u>X</u>	Depth (inches): _____	
Water Table Present?	Yes <u>X</u>	No _____	Depth (inches): <u>4"</u>	
Saturation Present?	Yes <u>X</u>	No _____	Depth (inches): <u>4"</u>	

(includes capillary fringe)

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/3/2014Sampling point: WL-33**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <i>Phragmites australis</i> Common Reed	95	Y	FACW
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
Total Cover: 95	50% of total cover 20% of total cover	48% 19%	_____

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Dominance Test worksheet:

Number of Dominant species
That are OBL, FACW, or FAC: 1 (A)

Total number of Dominant
Species across All Strata: 1 (B)

Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤ 3.0 ¹
- ☐ 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling /Shrub - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

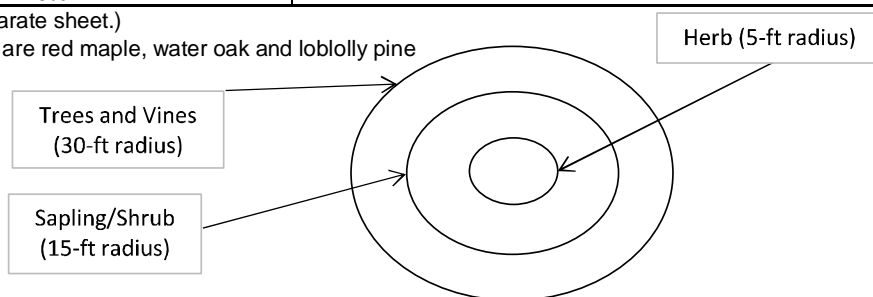
Woody Vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present?

Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

The fringe of this wetland is forested . Tree species are red maple, water oak and loblolly pine



Project/Site: I-64 /High Rise Bridge Corridor Study

Sampling date: 2/3/2014

Sampling point: WL-33

Soil**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	10YR 3/1	100					silt loam	
3-8	10YR 7/1	40	10YR 3/4	20			sand	
	10YR 7/2	40					sand	
8-16+	10YR 5/1	100					sand	saturated (wet)

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input checked="" type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks: Soil saturated from 4"+ below soil surface

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 2/3/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-34
 Investigator(s): Glenn Wilson and David Kwasniewski Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): tidal floodplain Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 45' 33.38" Long: 76° 18' 35.25" Datum: WGS 84
 Soil Map Unit Name: Udorthents-Urban land complex NWI classification: E2EM1P
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	
Remarks: Tidal E2EM5 Wetland (<i>Phragmites australis</i> dominant) Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location) This wetland is located to the north of I-64 within tidal waters			

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply) <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Aquatic Fauna (B13) <input checked="" type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Marl Deposits (B15) (LRR U) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Presence of Reduced Iron (C4) <input checked="" type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Recent Reduction in Tilled Soils (C6) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Other (Explain in Remarks) <input checked="" type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input checked="" type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input checked="" type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)

Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>2"</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>2"</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
--	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/3/2014Sampling point: WL-34**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0 50% of total cover 0% 20% of total cover 0%			

Dominance Test worksheet:Number of Dominant species That are OBL, FACW, or FAC: 2 (A)Total number of Dominant Species across All Strata: 2 (B)Percent of Dominant Species That are OBL, FACW, or FAC: 100% (A/B)**Prevalence Index worksheet:**

Total % Cover of Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- x 2 - Dominance Test is >50%
- 3 - Prevalence Index is ≤ 3.0 ¹
- 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

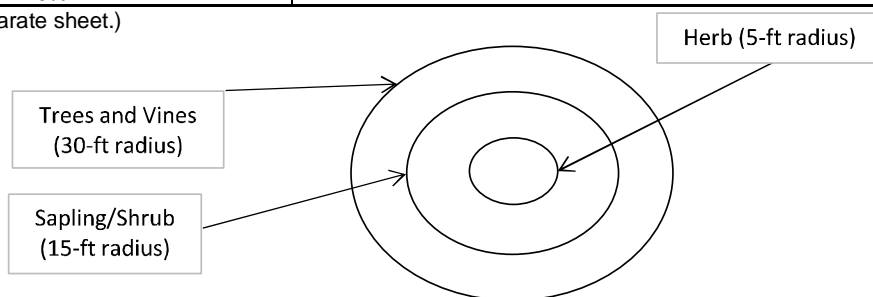
¹Indicators of hydric soil and wetland hydrology must be present**Definitions of Four Vegetation Strata:****Tree** - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.**Sapling /Shrub** - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.**Woody Vine** - All woody vines greater than 3.28 ft in height.**Hydrophytic Vegetation Present?**Yes X No _____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Baccharis halimifolia</u>	<u>2</u>	<u>Y</u>	<u>FAC</u>
2. <u>Groundsel tree</u>	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 2 50% of total cover 1% 20% of total cover 0%			

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Phragmites australis</u>	<u>80</u>	<u>Y</u>	<u>FACW</u>
2. <u>Common Reed</u>	_____	_____	_____
3. <u>Spartina patens</u>	<u>5</u>	<u>N</u>	<u>FACW</u>
4. <u>Salt-Meadow Cord Grass</u>	_____	_____	_____
5. <u>Spartina alterniflora</u>	<u>5</u>	<u>N</u>	<u>OBL</u>
6. <u>Saltwater Cord Grass</u>	_____	_____	_____
Total Cover: 90 50% of total cover 45% 20% of total cover 18%			

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0 50% of total cover 0% 20% of total cover 0%			

Remarks: (Include photo numbers here or on a separate sheet.)



Project/Site: I-64 /High Rise Bridge Corridor Study

Sampling date: 2/3/2014

Sampling point: WL-34

Soil**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	10YR 4/2	100					fine silt loam	
2-16+	10YR 4/1	100					loamy sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks: Soil saturated from 4"+ below soil surface

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 2/3/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-35, 36
 Investigator(s): Glenn Wilson and David Kwasniewski Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): tidal floodplain Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 45' 30.76" Long: 76° 18' 31.25" Datum: WGS 84
 Soil Map Unit Name: Udorthents-Urban land complex, Wando loamy fine sand, and Dragston fine sandy loam NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	
Remarks: Tidal E2EM5 Wetland (<i>Phragmites australis</i> dominant) Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location) This wetland is located to the south of I-64 within tidal waters			

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)		
<u>X</u> Surface Water (A1)	_____ Aquatic Fauna (B13)	_____ Surface Soil Cracks (B6)
<u>X</u> High Water Table (A2)	_____ Marl Deposits (B15) (LRR U)	_____ Sparsely Vegetated Concave Surface (B8)
<u>X</u> Saturation (A3)	_____ Hydrogen Sulfide Odor (C1)	_____ Drainage Patterns (B10)
_____ Water Marks (B1)	_____ Oxidized Rhizospheres on Living Roots (C3)	_____ Moss Trim Lines (B16)
_____ Sediment Deposits (B2)	_____ Presence of Reduced Iron (C4)	_____ Dry-Season Water Table (C2)
_____ Drift Deposits (B3)	_____ Recent Reduction in Tilled Soils (C6)	_____ Crayfish Burrows (C8)
_____ Algal Mat or Crust (B4)	_____ Thin Muck Surface (C7)	_____ Saturation Visible on Aerial Imagery (C9)
_____ Iron Deposits (B5)	_____ Other (Explain in Remarks)	<u>X</u> Geomorphic Position (D2)
_____ Inundation Visible on Aerial Imagery (B7)		_____ Shallow Aquitard (D3)
<u>X</u> Water-Stained Leaves (B9)		<u>X</u> FAC-Neutral Test (D5)
		_____ Sphagnum moss (D8) (LRR T, U)

Field Observations:				Wetland Hydrology Present? Yes <u>X</u> No _____
Surface Water Present?	Yes <u>X</u> No _____	Depth (inches):	<u>0"</u>	
Water Table Present?	Yes <u>X</u> No _____	Depth (inches):	<u>0"</u>	
Saturation Present?	Yes <u>X</u> No _____	Depth (inches):	<u>0"</u>	
(includes capillary fringe)				

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Water is at the soil surface

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/3/2014Sampling point: WL-35, 36**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u><i>Pinus taeda</i></u>	20	Y	FAC
<u>Loblolly Pine</u>			
2. _____			
3. _____			
4. _____			
Total Cover: 20	50% of total cover 20% of total cover	10% 4%	

Sapling /Shrub Stratum (ft)			
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	

Herb Stratum ()			
1. <u><i>Phragmites australis</i></u>	90	Y	FACW
<u>Common Reed</u>			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
Total Cover: 90	50% of total cover 20% of total cover	45% 18%	

Woody Vine Stratum ()			
1. <u><i>Smilax rotundifolia</i></u>	3	Y	FAC
<u>Horsebrier</u>			
2. _____			
3. _____			
4. _____			
Total Cover: 3	50% of total cover 20% of total cover	2% 1%	

Dominance Test worksheet:Number of Dominant species
That are OBL, FACW, or FAC: 3 (A)Total number of Dominant
Species across All Strata: 3 (B)Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)**Prevalence Index worksheet:**

Total % Cover of Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

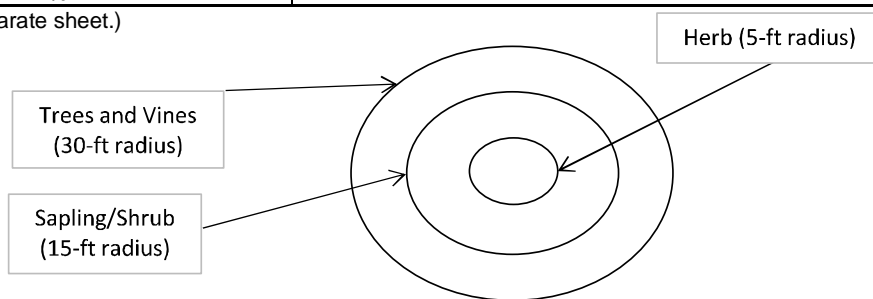
Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤ 3.0 ¹
- ☐ 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present**Definitions of Four Vegetation Strata:****Tree** - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.**Sapling /Shrub** - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.**Woody Vine** - All woody vines greater than 3.28 ft in height.**Hydrophytic Vegetation Present?**Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)



Project/Site: I-64 /High Rise Bridge Corridor Study

Sampling date: 2/3/2014

Sampling point: WL-35, 36

Soil

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	10YR 3/1	100					loamy sand	
3-7	10YR 5/1	100					sand	medium grain
7-15+	10YR 6/1	50	10YR 4/6	50			sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

Indicators for Problematic Hydric Soils³:

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks: streaking was observed starting at 7"+

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 2/3/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-37
 Investigator(s): Glenn Wilson and David Kwasniewski Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): tidal floodplain Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 45' 31.38" Long: 76° 18' 37.99" Datum: WGS 84
 Soil Map Unit Name: Water and Udorthents-Urban land complex NWI classification: E2USN and E1UBL
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	
Remarks: Tidal E2EM Wetland Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location) This wetland is located to the south of I-64 within tidal waters Rip rap was observed along the I-64 (northside) embankment			

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)		
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Moss Trim Lines (B16)
<input checked="" type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input checked="" type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Reduction in Tilled Soils (C6)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input checked="" type="checkbox"/> Shallow Aquitard (D3)
<input checked="" type="checkbox"/> Water-Stained Leaves (B9)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
		<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)

Field Observations:				Wetland Hydrology Present? Yes <u>X</u> No _____
Surface Water Present?	Yes <u>X</u>	No _____	Depth (inches): <u>0"</u>	
Water Table Present?	Yes <u>X</u>	No _____	Depth (inches): <u>0"</u>	
Saturation Present?	Yes <u>X</u>	No _____	Depth (inches): <u>0"</u>	
(includes capillary fringe)				

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: inundation was observed in the middle of the wetland but not the fringe
 Water is at the soil surface

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/3/2014Sampling point: WL-37**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Dominance Test worksheet:

Number of Dominant species
That are OBL, FACW, or FAC: 3 (A)

Total number of Dominant
Species across All Strata: 3 (B)

Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is $\leq 3.0^1$
- ☐ 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling /Shrub - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present?

Yes X No _____

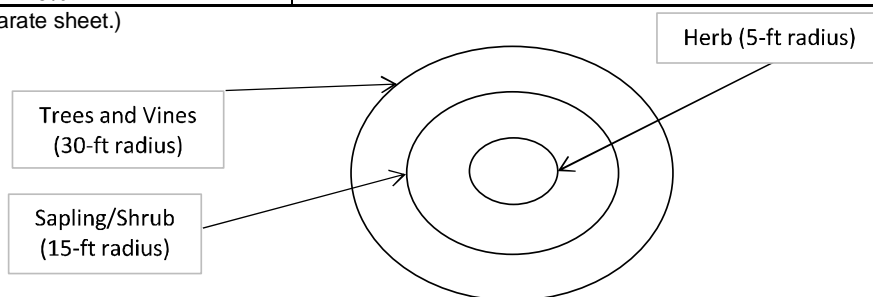
Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Morella cerifera</u>	<u>2</u>	<u>Y</u>	<u>FAC</u>
2. <u>Southern Bayberry</u>	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 2	50% of total cover 20% of total cover	1% 0%	_____

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Phragmites australis</u>	<u>35</u>	<u>Y</u>	<u>FACW</u>
2. <u>Spartina alterniflora</u>	<u>10</u>	<u>Y</u>	<u>OBL</u>
3. <u>Saltwater Cord Grass</u>	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
Total Cover: 45	50% of total cover 20% of total cover	23% 9%	_____

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Remarks: (Include photo numbers here or on a separate sheet.)

This area has approximately 40% open water



Project/Site: I-64 /High Rise Bridge Corridor Study

Sampling date: 2/3/2014

Sampling point: WL-37

Soil**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-5	10YR 3/2	100					loam	
5-16+	10YR 4/1	100					loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input checked="" type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks: streaking was observed starting at 7"+

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 2/3/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-38
 Investigator(s): Glenn Wilson and David Kwasniewski Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): tidal floodplain Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 45' 29.74" Long: 76° 18' 14.41" Datum: WGS 84
 Soil Map Unit Name: Udorthents-Urban land complex NWI classification: E1UBL and N/A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	

Remarks: Tidal E2EM5 Wetland (*Phragmites australis* dominant)
 Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location)
 This wetland is located to the south of I-64 within tidal waters
 This wetland is located at the upper finger of tidal area

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)		
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Reduction in Tilled Soils (C6)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input checked="" type="checkbox"/> Shallow Aquitard (D3)
<input checked="" type="checkbox"/> Water-Stained Leaves (B9)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
		<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)

Field Observations:			
Surface Water Present?	Yes _____ No <u>X</u>	Depth (inches):	_____ -
Water Table Present?	Yes <u>X</u> No _____	Depth (inches):	_____ 7"
Saturation Present?	Yes <u>X</u> No _____	Depth (inches):	_____ 7"
(includes capillary fringe)		Wetland Hydrology Present? Yes <u>X</u> No _____	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/3/2014Sampling point: WL-38**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Iva frutescens</u>	10	Y	FACW
_____	_____	_____	_____
2. <u>Jesuit's-Bark</u>	_____	_____	_____
3. <u>Baccharis halimifolia</u>	10	Y	FAC
_____	_____	_____	_____
4. <u>Groundsel tree</u>	_____	_____	_____
_____	_____	_____	_____
5. _____	_____	_____	_____
_____	_____	_____	_____
Total Cover: 20	50% of total cover 20% of total cover	10% 4%	_____

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Phragmites australis</u>	65	Y	FACW
_____	_____	_____	_____
2. <u>Common Reed</u>	_____	_____	_____
_____	_____	_____	_____
3. _____	_____	_____	_____
_____	_____	_____	_____
4. _____	_____	_____	_____
_____	_____	_____	_____
5. _____	_____	_____	_____
_____	_____	_____	_____
6. _____	_____	_____	_____
_____	_____	_____	_____
Total Cover: 65	50% of total cover 20% of total cover	33% 13%	_____

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
_____	_____	_____	_____
2. _____	_____	_____	_____
_____	_____	_____	_____
3. _____	_____	_____	_____
_____	_____	_____	_____
4. _____	_____	_____	_____
_____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Dominance Test worksheet:

Number of Dominant species
That are OBL, FACW, or FAC: 3 (A)

Total number of Dominant
Species across All Strata: 3 (B)

Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is $\leq 3.0^1$
- ☐ 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

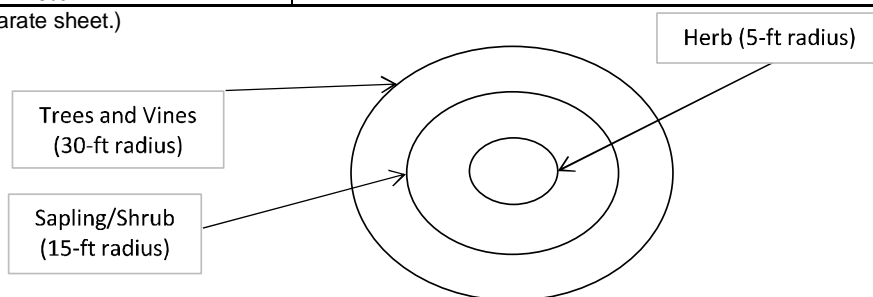
Sapling /Shrub - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present?Yes ☒ No ☐

Remarks: (Include photo numbers here or on a separate sheet.)



Project/Site: I-64 /High Rise Bridge Corridor Study

Sampling date: 2/3/2014

Sampling point: WL-38

Soil**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	10YR 3/1	100					loam	
2-11	10YR 5/2	100					sand	fine sand
11-12+	10YR 5/1	90	10YR 5/3	10			sand	fine sand

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input checked="" type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks: Soil streaking was observed in the sand layer

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 2/3/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-39
 Investigator(s): Glenn Wilson and David Kwasniewski Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): tidal floodplain Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 45' 28.03" Long: 76° 18' 12.84" Datum: WGS 84
 Soil Map Unit Name: Udorthents-Urban land complex NWI classification: E1UBL and E2EM1P
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	
Remarks: Tidal E2EM Wetland Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location) This wetland is located to the south of I-64 within tidal waters			

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)		
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input checked="" type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Reduction in Tilled Soils (C6)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input checked="" type="checkbox"/> Shallow Aquitard (D3)
<input checked="" type="checkbox"/> Water-Stained Leaves (B9)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
		<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)

Field Observations:				Wetland Hydrology Present? Yes <u>X</u> No _____
Surface Water Present?	Yes _____ No <u>X</u>	Depth (inches):	_____ -	
Water Table Present?	Yes <u>X</u> No _____	Depth (inches):	_____ 0"	
Saturation Present?	Yes <u>X</u> No _____	Depth (inches):	_____ 0"	
(includes capillary fringe)				

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Water is at soil surface

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/3/2014Sampling point: WL-39**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Dominance Test worksheet:

Number of Dominant species
That are OBL, FACW, or FAC: 3 (A)

Total number of Dominant
Species across All Strata: 3 (B)

Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- x 2 - Dominance Test is >50%
- 3 - Prevalence Index is ≤ 3.0 ¹
- 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling /Shrub - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine - All woody vines greater than 3.28 ft in height.

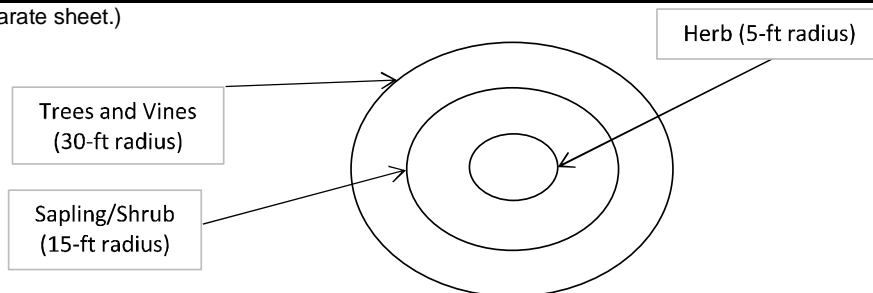
Hydrophytic Vegetation Present?Yes X No _____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Baccharis halimifolia</u>	<u>5</u>	<u>Y</u>	<u>FAC</u>
<u>Groundsel tree</u>	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 5	50% of total cover 20% of total cover	3% 1%	_____

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Spartina patens</u>	<u>30</u>	<u>Y</u>	<u>FACW</u>
<u>Salt-Meadow Cord Grass</u>	_____	_____	_____
2. <u>Aster spp.</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>
3. <u>Spartina cynosuroides</u>	<u>10</u>	<u>N</u>	<u>OBL</u>
<u>Big Cord Grass</u>	_____	_____	_____
4. <u>Phragmites australis</u>	<u>5</u>	<u>N</u>	<u>FACW</u>
<u>Common Reed</u>	_____	_____	_____
5. <u>Juncus roemerianus</u>	<u>5</u>	<u>N</u>	<u>OBL</u>
<u>Roemer's Rush</u>	_____	_____	_____
6. _____	_____	_____	_____
Total Cover: 70	50% of total cover 20% of total cover	35% 14%	_____

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Remarks: (Include photo numbers here or on a separate sheet.)



Project/Site: I-64 /High Rise Bridge Corridor Study

Sampling date: 2/3/2014

Sampling point: WL-39

Soil**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	10YR 3/1	100					loam	many roots
4-7	10YR 3/1	100					sandy loam	
7-12+	10YR 5/1	100					sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks:

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 2/6/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-40, 41, 42
 Investigator(s): David Kwasniewski and Glenn Wilson Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): tidal marsh Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 45' 35.49" Long: 76° 18' 04.96" Datum: WGS 84
 Soil Map Unit Name: Pacaty mucky peat NWI classification: N/A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	

Remarks: Tidal E2EM Wetland
 Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location)
 Wetland 40 and 41 located north of I-64, Wetland 42 located south of I-64 within tidal waters

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)	
Primary Indicators (minimum of one is required; check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	
<input checked="" type="checkbox"/> Saturation (A3)	<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input checked="" type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Moss Trim Lines (B16)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Reduction in Tilled Soils (C6)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input checked="" type="checkbox"/> Water-Stained Leaves (B9)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	
		<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)	

Field Observations:					Wetland Hydrology Present? Yes <u> X </u> No <u> </u>				
Surface Water Present?	Yes	<u> </u>	No	<u> X </u>				Depth (inches):	<u> - </u>
Water Table Present?	Yes	<u> X </u>	No	<u> </u>				Depth (inches):	<u> 0" </u>
Saturation Present?	Yes	<u> X </u>	No	<u> </u>				Depth (inches):	<u> 0" </u>
(includes capillary fringe)									

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Data recorded in February, with over 0.5" of precip in the previous week.

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/6/2014Sampling point: WL-40, 41, 42**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Juncus roemeranus</u> needlegrass rush	50	Y	OBL
2. <u>Spartina alterniflora</u> Saltwater Cord Grass	50	Y	OBL
3. <u>Distichlis spicata</u> coastal salt grass	5	N	FACW
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
Total Cover: 105	50% of total cover 20% of total cover	53% 21%	_____

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Dominance Test worksheet:

Number of Dominant species
That are OBL, FACW, or FAC: 2 (A)

Total number of Dominant
Species across All Strata: 2 (B)

Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____	(A) _____ (B) _____
Prevalence Index = B/A = _____	

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
x 2 - Dominance Test is >50%
3 - Prevalence Index is $\leq 3.0^1$
4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

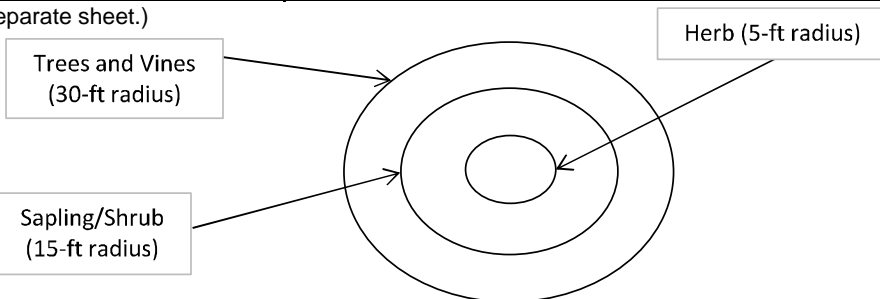
Sapling /Shrub - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present?Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)



Project/Site: I-64 /High Rise Bridge Corridor Study

Sampling date: 2/6/2014

Sampling point: WL-40, 41, 42

Soil**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	10YR 4/2	100					silt loam	wet, organic root mat
4-10	7.5YR 5/1	100					clay loam	wet, organic root mat
10-16+	10YR 3/1	100					silt loam	wet

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks: sulfidic odors observed in upper 12"

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 2/4/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-43-44
 Investigator(s): Glenn Wilson and David Kwasniewski Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): tidal floodplain Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 45' 30.67" Long: 76° 17' 33.48" Datum: WGS 84
 Soil Map Unit Name: Udorthents-Urban land complex and Water NWI classification: E2USN, E2EM1P, and E1UBL
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	
Remarks: Tidal E2EM Wetland Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location) This wetland is located to the north of I-64 within tidal waters adjacent and west of railroad			

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)		
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Reduction in Tilled Soils (C6)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input type="checkbox"/> Shallow Aquitard (D3)
<input checked="" type="checkbox"/> Water-Stained Leaves (B9)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
		<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)

Field Observations:

Surface Water Present? Yes _____ No <u>X</u>	Depth (inches): _____	Wetland Hydrology Present? Yes <u>X</u> No _____
Water Table Present? Yes <u>X</u> No _____	Depth (inches): <u>2"</u>	
Saturation Present? Yes <u>X</u> No _____	Depth (inches): <u>2"</u>	
(includes capillary fringe)		
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		

Remarks: Stream flows through wetland

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/4/2014Sampling point: WL-43-44**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Dominance Test worksheet:

Number of Dominant species
That are OBL, FACW, or FAC: 2 (A)

Total number of Dominant
Species across All Strata: 2 (B)

Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- x 2 - Dominance Test is >50%
- 3 - Prevalence Index is $\leq 3.0^1$
- 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling /Shrub - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present?

Yes X No _____

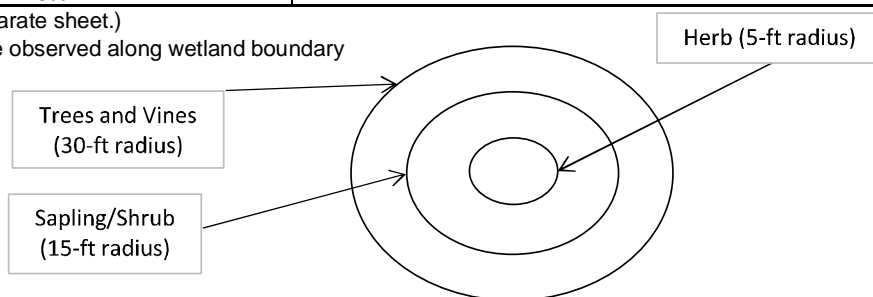
Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Baccharis halimifolia</u>	<u>2</u>	<u>Y</u>	<u>FAC</u>
Groundseltree	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 2	50% of total cover 20% of total cover	1% 0%	_____

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Spartina alterniflora</u>	<u>85</u>	<u>Y</u>	<u>OBL</u>
Saltwater Cord Grass	_____	_____	_____
2. <u>Phragmites australis</u>	<u>10</u>	<u>N</u>	<u>FACW</u>
Common Reed	_____	_____	_____
3. <u>Spartina cynosuroides</u>	<u>5</u>	<u>N</u>	<u>OBL</u>
Big Cord Grass	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
Total Cover: 100	50% of total cover 20% of total cover	50% 20%	_____

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Remarks: (Include photo numbers here or on a separate sheet.)

Baccharis halimifolia and *Phragmites australis* were observed along wetland boundary



Project/Site: I-64 /High Rise Bridge Corridor Study

Sampling date: 2/4/2014

Sampling point: WL-43-44

Soil**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-5	10YR 3/2	100					silt loam	many roots, root mat
5-16+	10YR 5/1	100					sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input checked="" type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks: streaking was observed starting at 7"+

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 2/4/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-45
 Investigator(s): Glenn Wilson and David Kwasniewski Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): tidal floodplain Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 45' 29.93" Long: 76° 17' 31.45" Datum: WGS 84
 Soil Map Unit Name: Pocaty mucky peat NWI classification: E1UBL and N/A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	
Remarks: Tidal E2EM5 Wetland (<i>Phragmites australis</i> dominant) Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location) This wetland is located to the north of I-64 within tidal waters			

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)		
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Reduction in Tilled Soils (C6)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input checked="" type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Water-Stained Leaves (B9)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
		<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)

Field Observations:			
Surface Water Present?	Yes _____ No <u>X</u>	Depth (inches):	_____ -
Water Table Present?	Yes <u>X</u> No _____	Depth (inches):	_____ 2"
Saturation Present?	Yes <u>X</u> No _____	Depth (inches):	_____ 2"
(includes capillary fringe)		Wetland Hydrology Present? Yes <u>X</u> No _____	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: adjacent to tidal channel

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/4/2014Sampling point: WL-45**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Dominance Test worksheet:Number of Dominant species
That are OBL, FACW, or FAC: 3 (A)Total number of Dominant
Species across All Strata: 3 (B)Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)**Prevalence Index worksheet:**

Total % Cover of Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- x 2 - Dominance Test is >50%
- 3 - Prevalence Index is ≤ 3.0 ¹
- 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

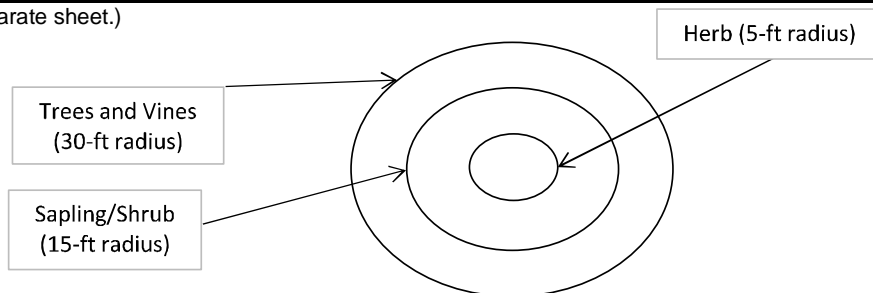
¹Indicators of hydric soil and wetland hydrology must be present**Definitions of Four Vegetation Strata:****Tree** - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.**Sapling /Shrub** - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.**Woody Vine** - All woody vines greater than 3.28 ft in height.**Hydrophytic Vegetation Present?**Yes X No _____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Iva frutescens</u>	<u>5</u>	<u>Y</u>	<u>FACW</u>
2. <u>Jesuit's-Bark</u>	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 5	50% of total cover 20% of total cover	3% 1%	_____

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Phragmites australis</u>	<u>95</u>	<u>Y</u>	<u>FACW</u>
2. <u>Common Reed</u>	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
Total Cover: 95	50% of total cover 20% of total cover	48% 19%	_____

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Lonicera japonica</u>	<u>5</u>	<u>Y</u>	<u>FAC</u>
2. <u>Japanese Honeysuckle</u>	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 5	50% of total cover 20% of total cover	3% 1%	_____

Remarks: (Include photo numbers here or on a separate sheet.)



Project/Site: I-64 /High Rise Bridge Corridor Study

Sampling date: 2/4/2014

Sampling point: WL-45

Soil**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	10YR 4/2	98	10YR 4/3	2			loamy sand	roots common
3-9	10YR 5/1	95	10YR 4/4	5			loamy sand	roots common
9-13	10YR 3/1	100					loamy sand	
13-16	10YR 4/1	100					sand	
16-20	10YR 6/1	100					fine sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks:

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 2/4/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-46
 Investigator(s): Glenn Wilson and David Kwasniewski Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): tidal floodplain Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 45' 29.23" Long: 76° 17' 30.18" Datum: WGS 84
 Soil Map Unit Name: Udorthents-Urban land complex NWI classification: N/A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	
Remarks: Tidal E2EM5 Wetland (<i>Phragmites australis</i> dominant) Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location) This wetland is located to the north of I-64 within tidal waters Location is between railroad			

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input checked="" type="checkbox"/> Shallow Aquitard (D3)
<input checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)
<input type="checkbox"/> Marl Deposits (B15) (LRR U)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:			
Surface Water Present?	Yes _____ No <u>X</u>	Depth (inches):	_____ -
Water Table Present?	Yes <u>X</u> No _____	Depth (inches):	_____ 0"
Saturation Present?	Yes <u>X</u> No _____	Depth (inches):	_____ 0"
(includes capillary fringe)		Wetland Hydrology Present? Yes <u>X</u> No _____	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Appears to have sub-surface communication to tidal flows

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/4/2014Sampling point: WL-46**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0 50% of total cover 0% 20% of total cover 0%			

Dominance Test worksheet:Number of Dominant species That are OBL, FACW, or FAC: 3 (A)Total number of Dominant Species across All Strata: 3 (B)Percent of Dominant Species That are OBL, FACW, or FAC: 100% (A/B)**Prevalence Index worksheet:**

Total % Cover of Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is $\leq 3.0^1$
- ☐ 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

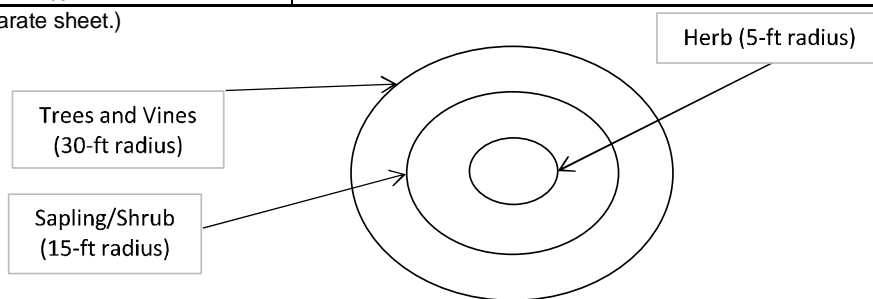
¹Indicators of hydric soil and wetland hydrology must be present**Definitions of Four Vegetation Strata:****Tree** - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.**Sapling /Shrub** - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.**Woody Vine** - All woody vines greater than 3.28 ft in height.**Hydrophytic Vegetation Present?**Yes X No _____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Baccharis halimifolia</u>	<u>10</u>	<u>Y</u>	<u>FAC</u>
2. <u>Groundsel tree</u>	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 10 50% of total cover 5% 20% of total cover 2%			

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Phragmites australis</u>	<u>95</u>	<u>Y</u>	<u>FACW</u>
2. <u>Common Reed</u>	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
Total Cover: 95 50% of total cover 48% 20% of total cover 19%			

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Lonicera japonica</u>	<u>3</u>	<u>Y</u>	<u>FAC</u>
2. <u>Japanese Honeysuckle</u>	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 3 50% of total cover 2% 20% of total cover 1%			

Remarks: (Include photo numbers here or on a separate sheet.)



Project/Site: I-64 /High Rise Bridge Corridor Study

Sampling date: 2/4/2014

Sampling point: WL-46

Soil

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	10YR 3/1	100					loamy sand	many roots
4-9	10YR 5/1	80	10YR 4/4	20			loamy sand	few roots
9-16+	10YR 4/2	90	10YR 4/4	10			loamy sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

Indicators for Problematic Hydric Soils³:

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks:

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 2/4/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-47, 48, 49
 Investigator(s): Glenn Wilson and David Kwasniewski Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): tidal floodplain Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 45' 33.60" Long: 76° 17' 26.25" Datum: WGS 84
 Soil Map Unit Name: Pocaty mucky peat, Nawney silt loam, and Water NWI classification: E2EM1P
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	
Remarks: Tidal E2EM Wetland Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location) This wetland is located to the north of I-64 within tidal waters			

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Shallow Aquitard (D3)
<input checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)
<input type="checkbox"/> Marl Deposits (B15) (LRR U)	
<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations: Surface Water Present? Yes <u>X</u> No _____ Depth (inches): <u>2"</u> Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>0"</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>0"</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
--	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Stream flows through wetland

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/4/2014Sampling point: WL-47, 48, 49**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0 50% of total cover 0% 20% of total cover 0%			

Dominance Test worksheet:Number of Dominant species
That are OBL, FACW, or FAC: 1 (A)Total number of Dominant
Species across All Strata: 1 (B)Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)**Prevalence Index worksheet:**

Total % Cover of Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is $\leq 3.0^1$
- ☐ 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

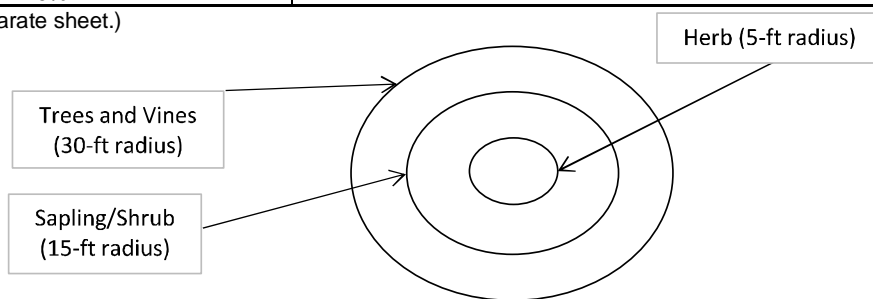
¹Indicators of hydric soil and wetland hydrology must be present**Definitions of Four Vegetation Strata:****Tree** - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.**Sapling /Shrub** - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.**Woody Vine** - All woody vines greater than 3.28 ft in height.**Hydrophytic Vegetation Present?**Yes X No _____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 0 50% of total cover 0% 20% of total cover 0%			

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Spartina alterniflora</u> Saltwater Cord Grass	85	Y	OBL
2. <u>Spartina patens</u> Freshwater Cord Grass	20	N	OBL
3. <u>Phragmites australis</u> Common Reed	5	N	FACW
4. <u>Juncus roemerianus</u> Roemer's Rush	5	N	OBL
5. _____	_____	_____	_____
6. _____	_____	_____	_____
Total Cover: 115 50% of total cover 58% 20% of total cover 23%			

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0 50% of total cover 0% 20% of total cover 0%			

Remarks: (Include photo numbers here or on a separate sheet.)



Project/Site: I-64 /High Rise Bridge Corridor Study

Sampling date: 2/4/2014

Sampling point: WL-47, 48, 49

Soil**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-6	10YR 3/1	100					silt loam	many roots, root mat
6-16+	10YR 3/2	100					silt loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input checked="" type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks: streaking was observed starting at 7"+

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 2/4/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-48, 50
 Investigator(s): Glenn Wilson and David Kwasniewski Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): tidal floodplain Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 45' 32.21" Long: 76° 17' 20.96" Datum: WGS 84
 Soil Map Unit Name: Pocaty mucky peat and Dragston-Urban land complex NWI classification: E2EM1P
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	
Remarks: Tidal E2EM Wetland Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location) This wetland is located to the north of I-64 and does not have a tidal influence Near substation			

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	
<input checked="" type="checkbox"/> Surface Water (A1) _____ Aquatic Fauna (B13) <input checked="" type="checkbox"/> High Water Table (A2) _____ Marl Deposits (B15) (LRR U) <input checked="" type="checkbox"/> Saturation (A3) _____ Hydrogen Sulfide Odor (C1) _____ Water Marks (B1) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Sediment Deposits (B2) _____ Presence of Reduced Iron (C4) _____ Drift Deposits (B3) _____ Recent Reduction in Tilled Soils (C6) _____ Algal Mat or Crust (B4) _____ Thin Muck Surface (C7) _____ Iron Deposits (B5) _____ Other (Explain in Remarks) _____ Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Water-Stained Leaves (B9)	_____ Surface Soil Cracks (B6) _____ Sparsely Vegetated Concave Surface (B8) <input checked="" type="checkbox"/> Drainage Patterns (B10) _____ Moss Trim Lines (B16) _____ Dry-Season Water Table (C2) _____ Crayfish Burrows (C8) _____ Saturation Visible on Aerial Imagery (C9) <input checked="" type="checkbox"/> Geomorphic Position (D2) _____ Shallow Aquitard (D3) <input checked="" type="checkbox"/> FAC-Neutral Test (D5) _____ Sphagnum moss (D8) (LRR T, U)

Field Observations: Surface Water Present? Yes <u>X</u> No _____ Depth (inches): <u>2"</u> Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>0"</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>0"</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
--	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/4/2014Sampling point: WL-48, 50**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Dominance Test worksheet:Number of Dominant species
That are OBL, FACW, or FAC: 2 (A)Total number of Dominant
Species across All Strata: 2 (B)Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)**Prevalence Index worksheet:**

Total % Cover of Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- x 2 - Dominance Test is >50%
- 3 - Prevalence Index is $\leq 3.0^1$
- 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

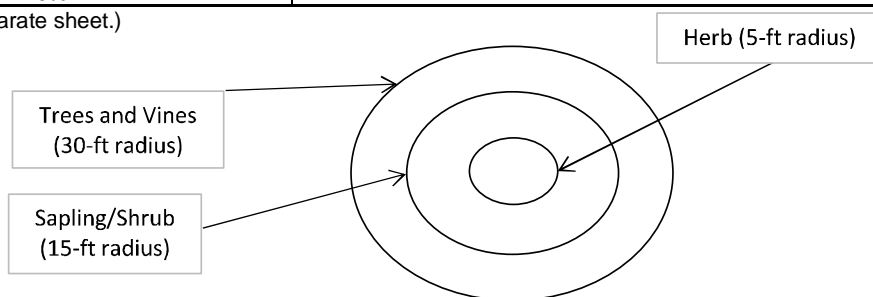
¹Indicators of hydric soil and wetland hydrology must be present**Definitions of Four Vegetation Strata:****Tree** - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.**Sapling /Shrub** - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.**Woody Vine** - All woody vines greater than 3.28 ft in height.**Hydrophytic Vegetation Present?**Yes X No _____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Baccharis halimifolia</u>	<u>2</u>	<u>Y</u>	<u>FAC</u>
<u>Groundsel tree</u>	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 2	50% of total cover 20% of total cover	1% 0%	_____

Herb Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Spartina alterniflora</u>	<u>90</u>	<u>Y</u>	<u>OBL</u>
<u>Saltwater Cord Grass</u>	_____	_____	_____
2. <u>Phragmites australis</u>	<u>10</u>	<u>N</u>	<u>FACW</u>
<u>Common Reed</u>	_____	_____	_____
3. <u>Distichlis spicata</u>	<u>5</u>	<u>N</u>	<u>OBL</u>
<u>Coastal Salt Grass</u>	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
Total Cover: 105	50% of total cover 20% of total cover	53% 21%	_____

Woody Vine Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Remarks: (Include photo numbers here or on a separate sheet.)



Project/Site: I-64 /High Rise Bridge Corridor Study

Sampling date: 2/4/2014

Sampling point: WL-48, 50

Soil**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-12+	10YR 3/2	100					silt loam	many roots from 0-6"

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Stratified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks:

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 2/4/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-51
 Investigator(s): Glenn Wilson and David Kwasniewski Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): tidal floodplain Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 45' 30.74" Long: 76° 17' 29.20" Datum: WGS 84
 Soil Map Unit Name: Pocaty mucky peat NWI classification: E2EM1P and N/A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	
Remarks: Tidal E2EM5 Wetland (<i>Phragmites australis</i> dominant) Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location) This wetland is located to the north of I-64 within tidal waters			

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input checked="" type="checkbox"/> Shallow Aquitard (D3)
<input checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)
<input type="checkbox"/> Marl Deposits (B15) (LRR U)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): <u>-</u> Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>6"</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>6"</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
---	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/4/2014Sampling point: WL-51**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Dominance Test worksheet:Number of Dominant species
That are OBL, FACW, or FAC: 3 (A)Total number of Dominant
Species across All Strata: 3 (B)Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)**Prevalence Index worksheet:**

Total % Cover of Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is $\leq 3.0^1$
- ☐ 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

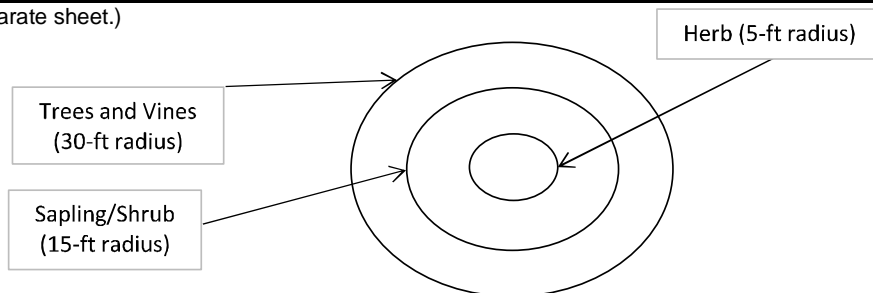
¹Indicators of hydric soil and wetland hydrology must be present**Definitions of Four Vegetation Strata:****Tree** - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.**Sapling /Shrub** - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.**Woody Vine** - All woody vines greater than 3.28 ft in height.**Hydrophytic Vegetation Present?**Yes X No _____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Baccharis halimifolia</u>	<u>5</u>	<u>Y</u>	<u>FAC</u>
2. <u>Groundsel tree</u>	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 5	50% of total cover 20% of total cover	3% 1%	_____

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Phragmites australis</u>	<u>95</u>	<u>Y</u>	<u>FACW</u>
2. <u>Common Reed</u>	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
Total Cover: 95	50% of total cover 20% of total cover	48% 19%	_____

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Lonicera japonica</u>	<u>2</u>	<u>Y</u>	<u>FAC</u>
2. <u>Japanese Honeysuckle</u>	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 2	50% of total cover 20% of total cover	1% 0%	_____

Remarks: (Include photo numbers here or on a separate sheet.)



Project/Site: I-64 /High Rise Bridge Corridor Study

Sampling date: 2/4/2014

Sampling point: WL-51

Soil**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-5	10YR 2/1	100					loam	few roots, some sand
5-13	10YR 3/1	100					fine sandy loam	
13+	10YR 4/3	100					loamy sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks: high concentration of oraganic material was observed throughout

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 2/4/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-52
 Investigator(s): Glenn Wilson and David Kwasniewski Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 45' 29.66" Long: 76° 17' 22.86" Datum: WGS 84
 Soil Map Unit Name: Udorthents-Urban land complex NWI classification: PFO1S
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	
Remarks: PFO Wetland Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location) This wetland is located to the north of I-64 and does not have a tidal influence			

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply) _____ Surface Water (A1) _____ Aquatic Fauna (B13) _____ High Water Table (A2) _____ Marl Deposits (B15) (LRR U) <u>X</u> _____ Saturation (A3) _____ Hydrogen Sulfide Odor (C1) _____ Water Marks (B1) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Sediment Deposits (B2) _____ Presence of Reduced Iron (C4) _____ Drift Deposits (B3) _____ Recent Reduction in Tilled Soils (C6) _____ Algal Mat or Crust (B4) _____ Thin Muck Surface (C7) _____ Iron Deposits (B5) _____ Other (Explain in Remarks) _____ Inundation Visible on Aerial Imagery (B7) <u>X</u> _____ Water-Stained Leaves (B9)	_____ Surface Soil Cracks (B6) _____ Sparsely Vegetated Concave Surface (B8) _____ Drainage Patterns (B10) _____ Moss Trim Lines (B16) _____ Dry-Season Water Table (C2) _____ Crayfish Burrows (C8) _____ Saturation Visible on Aerial Imagery (C9) _____ Geomorphic Position (D2) _____ Shallow Aquitard (D3) _____ FAC-Neutral Test (D5) _____ Sphagnum moss (D8) (LRR T, U)

Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>10"</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
--	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/4/2014Sampling point: WL-52**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Liquidambar styraciflua</u> Sweet-Gum	<u>20</u>	<u>Y</u>	<u>FAC</u>
2. <u>Quercus falcata</u> Southern Red Oak	<u>15</u>	<u>Y</u>	<u>FACU</u>
3. <u>Acer rubrum</u> Red Maple	<u>10</u>	<u>Y</u>	<u>FAC</u>
4. <u>Quercus phellos</u> Willow Oak	<u>5</u>	<u>N</u>	<u>FACW</u>
Total Cover: <u>50</u>	<u>50% of total cover</u> <u>20% of total cover</u>	<u>25%</u> <u>10%</u>	

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Morella cerifera</u> Southern Bayberry	<u>10</u>	<u>Y</u>	<u>FAC</u>
2. <u>Vaccinium corymbosum</u> Highbush Blueberry	<u>5</u>	<u>Y</u>	<u>FACW</u>
3. <u>Quercus nigra</u> Water Oak	<u>3</u>	<u>N</u>	<u>FAC</u>
4. <u>Magnolia virginiana</u> Sweet-Bay	<u>3</u>	<u>N</u>	<u>FACW</u>
5. <u>Aralia spinosa</u> Devil's-Walkingstick	<u>2</u>	<u>N</u>	<u>FAC</u>
Total Cover: <u>23</u>	<u>50% of total cover</u> <u>20% of total cover</u>	<u>12%</u> <u>5%</u>	

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Pteridium aquilinum</u> Northern Bracken Fern	<u>10</u>	<u>Y</u>	<u>FACU</u>
2. <u>Phragmites australis</u> Common Reed	<u>5</u>	<u>Y</u>	<u>FACW</u>
3. _____			
4. _____			
5. _____			
6. _____			
Total Cover: <u>15</u>	<u>50% of total cover</u> <u>20% of total cover</u>	<u>8%</u> <u>3%</u>	

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Smilax rotundifolia</u> Horsebrier	<u>15</u>	<u>Y</u>	<u>FAC</u>
2. _____			
3. _____			
4. _____			
Total Cover: <u>15</u>	<u>50% of total cover</u> <u>20% of total cover</u>	<u>8%</u> <u>3%</u>	

Dominance Test worksheet:

Number of Dominant species
That are OBL, FACW, or FAC: 6 (A)

Total number of Dominant
Species across All Strata: 8 (B)

Percent of Dominant Species
That are OBL, FACW, or FAC: 75% (A/B)

Prevalence Index worksheet:

Total % Cover of Multiply by:

OBL species x 1 =

FACW species x 2 =

FAC species x 3 =

FACU species x 4 =

UPL species x 5 =

Column Totals: (A) (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- x 2 - Dominance Test is >50%
- 3 - Prevalence Index is $\leq 3.0^1$
- 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling /Shrub - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

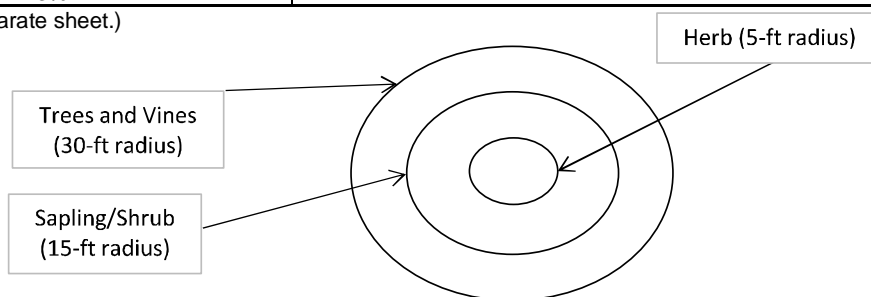
Woody Vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation

Present? Yes X No

Remarks: (Include photo numbers here or on a separate sheet.)

Tree species are dying and/or dead



Project/Site: I-64 /High Rise Bridge Corridor Study

Sampling date: 2/4/2014

Sampling point: WL-52

Soil**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	10YR 3/1	100					loam	
4-7	10YR 4/1	100					sandy loam	
7-10	10YR 4/2	100					loamy sand	
10-16	10YR 6/3	100					loamy sand	
16+	10YR 5/2	100					loamy sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks:

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 2/4/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-53
 Investigator(s): Glenn Wilson and David Kwasniewski Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): drainageway Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 45' 24.33" Long: 76° 17' 32.64" Datum: WGS 84
 Soil Map Unit Name: Udorthents-Urban land complex NWI classification: N/A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	
Remarks: PFO Wetland Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location) This wetland is located to the south of I-64 without a tidal influence Wildlife Meadow between railroad tracks			

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply) <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Aquatic Fauna (B13) <input checked="" type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Marl Deposits (B15) (LRR U) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input checked="" type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Recent Reduction in Tilled Soils (C6) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input checked="" type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)

Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>0"</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>0"</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
--	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No hydrogen sulfide odor was found
 Water was at soil surface

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/4/2014Sampling point: WL-53**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u><i>Pinus taeda</i></u> Loblolly Pine	<u>50</u>	<u>Y</u>	<u>FAC</u>
2. <u><i>Acer rubrum</i></u> Red Maple	<u>5</u>	<u>N</u>	<u>FAC</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: <u>55</u>	50% of total cover 20% of total cover	28% 11%	_____

Dominance Test worksheet:Number of Dominant species
That are OBL, FACW, or FAC: 5 (A)Total number of Dominant
Species across All Strata: 5 (B)Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)**Prevalence Index worksheet:**

Total % Cover of Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- x 2 - Dominance Test is >50%
- 3 - Prevalence Index is $\leq 3.0^1$
- 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

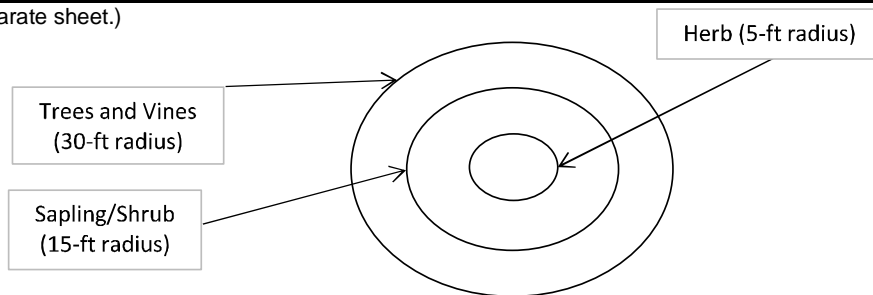
¹Indicators of hydric soil and wetland hydrology must be present**Definitions of Four Vegetation Strata:****Tree** - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.**Sapling /Shrub** - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.**Woody Vine** - All woody vines greater than 3.28 ft in height.**Hydrophytic Vegetation**Present? Yes X No _____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u><i>Baccharis halimifolia</i></u> Groundsel tree	<u>15</u>	<u>Y</u>	<u>FAC</u>
2. <u><i>Pinus taeda</i></u> Loblolly Pine	<u>10</u>	<u>Y</u>	<u>FAC</u>
3. <u><i>Acer rubrum</i></u> Red Maple	<u>3</u>	<u>N</u>	<u>FAC</u>
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: <u>28</u>	50% of total cover 20% of total cover	14% 6%	_____

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u><i>Phragmites australis</i></u> Common Reed	<u>5</u>	<u>Y</u>	<u>FACW</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
Total Cover: <u>5</u>	50% of total cover 20% of total cover	3% 1%	_____

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u><i>Lonicera japonica</i></u> Japanese Honeysuckle	<u>5</u>	<u>Y</u>	<u>FAC</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: <u>5</u>	50% of total cover 20% of total cover	3% 1%	_____

Remarks: (Include photo numbers here or on a separate sheet.)



Project/Site: I-64 /High Rise Bridge Corridor Study

Sampling date: 2/4/2014

Sampling point: WL-53

Soil**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	10YR 4/1	100					loamy sand	
3-7	2.5YR 5/2	95	10YR 4/3	2			loamy sand	
7-18	10YR 4/3	100					loamy fine sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks:

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 2/4/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-54
 Investigator(s): Glenn Wilson and David Kwasniewski Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): drainageway Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 45' 21.56" Long: 76° 17' 20.78" Datum: WGS 84
 Soil Map Unit Name: Udorthents-Urban land complex NWI classification: N/A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	
Remarks: PEM5 Wetland (<i>Phragmites australis</i> dominant) Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location) This wetland is located to the south of I-64 and does not have a tidal influence Adjacent to railroad			

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Shallow Aquitard (D3)
<input checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)
<input type="checkbox"/> Marl Deposits (B15) (LRR U)	
<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations: Surface Water Present? Yes <u>X</u> No _____ Depth (inches): <u>2"</u> Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>0"</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>0"</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
--	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/4/2014Sampling point: WL-54**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u><i>Pinus taeda</i></u> <u>Loblolly Pine</u>	10	Y	FAC
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 10	50% of total cover 20% of total cover	5% 2%	_____

Dominance Test worksheet:Number of Dominant species
That are OBL, FACW, or FAC: 6 (A)Total number of Dominant
Species across All Strata: 6 (B)Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)**Prevalence Index worksheet:**

Total % Cover of Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is $\leq 3.0^1$
- ☐ 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

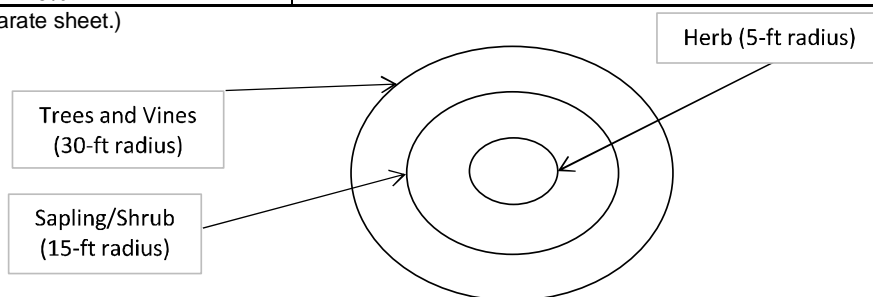
¹Indicators of hydric soil and wetland hydrology must be present**Definitions of Four Vegetation Strata:****Tree** - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.**Sapling /Shrub** - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.**Woody Vine** - All woody vines greater than 3.28 ft in height.**Hydrophytic Vegetation Present?**Yes X No _____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u><i>Baccharis halimifolia</i></u> <u>Groundsel tree</u>	5	Y	FAC
2. <u><i>Morella cerifera</i></u> <u>Southern Bayberry</u>	2	Y	FAC
3. <u><i>Pinus taeda</i></u> <u>Loblolly Pine</u>	2	Y	FAC
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 9	50% of total cover 20% of total cover	5% 2%	_____

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u><i>Phragmites australis</i></u> <u>Common Reed</u>	80	Y	FACW
2. <u><i>Panicum virgatum</i></u> <u>Wand Panic Grass</u>	5	Y	FAC
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
Total Cover: 85	50% of total cover 20% of total cover	43% 17%	_____

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Remarks: (Include photo numbers here or on a separate sheet.)



Project/Site: I-64 /High Rise Bridge Corridor Study

Sampling date: 2/4/2014

Sampling point: WL-54

Soil**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	10YR 4/2	100					loamy sand	
3-10	10YR 6/2	100					sand	medium grain
10-16+	10YR 6/1	100					sand	medium grain

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Stratified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks:

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 2/4/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-55, 56
 Investigator(s): Glenn Wilson and David Kwasniewski Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): tidal floodplain Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 45' 32.35" Long: 76° 17' 13.65" Datum: WGS 84
 Soil Map Unit Name: Dragston-Urban land complex and Pocaty mucky peat NWI classification: N/A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	

Remarks: Tidal E2EM Wetland
 Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location)
 This wetland is located to the north of I-64 within tidal waters

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)	
Primary Indicators (minimum of one is required; check all that apply)			
<u>X</u> Surface Water (A1)	_____ Aquatic Fauna (B13)	_____ Surface Soil Cracks (B6)	
<u>X</u> High Water Table (A2)	_____ Marl Deposits (B15) (LRR U)	_____ Sparsely Vegetated Concave Surface (B8)	
<u>X</u> Saturation (A3)	_____ Hydrogen Sulfide Odor (C1)	<u>X</u> Drainage Patterns (B10)	
<u>X</u> Water Marks (B1)	_____ Oxidized Rhizospheres on Living Roots (C3)	_____ Moss Trim Lines (B16)	
_____ Sediment Deposits (B2)	_____ Presence of Reduced Iron (C4)	_____ Dry-Season Water Table (C2)	
_____ Drift Deposits (B3)	_____ Recent Reduction in Tilled Soils (C6)	_____ Crayfish Burrows (C8)	
_____ Algal Mat or Crust (B4)	_____ Thin Muck Surface (C7)	_____ Saturation Visible on Aerial Imagery (C9)	
_____ Iron Deposits (B5)	_____ Other (Explain in Remarks)	<u>X</u> Geomorphic Position (D2)	
_____ Inundation Visible on Aerial Imagery (B7)		_____ Shallow Aquitard (D3)	
<u>X</u> Water-Stained Leaves (B9)		<u>X</u> FAC-Neutral Test (D5)	
		_____ Sphagnum moss (D8) (LRR T, U)	

Field Observations:				Wetland Hydrology Present? Yes <u>X</u> No _____
Surface Water Present?	Yes <u>X</u> No _____	Depth (inches):	<u>0"</u>	
Water Table Present?	Yes <u>X</u> No _____	Depth (inches):	<u>0"</u>	
Saturation Present?	Yes <u>X</u> No _____	Depth (inches):	<u>0"</u>	
(includes capillary fringe)				

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Water is at soil surface

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/4/2014Sampling point: WL-55, 56**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Spartina alterniflora</u> Saltwater Cord Grass	80	Y	OBL
2. <u>Phragmites australis</u> Common Reed	20	Y	FACW
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
Total Cover: 100	50% of total cover 20% of total cover	50% 20%	_____

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Dominance Test worksheet:

Number of Dominant species
That are OBL, FACW, or FAC: 2 (A)

Total number of Dominant
Species across All Strata: 2 (B)

Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤ 3.0 ¹
- ☐ 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

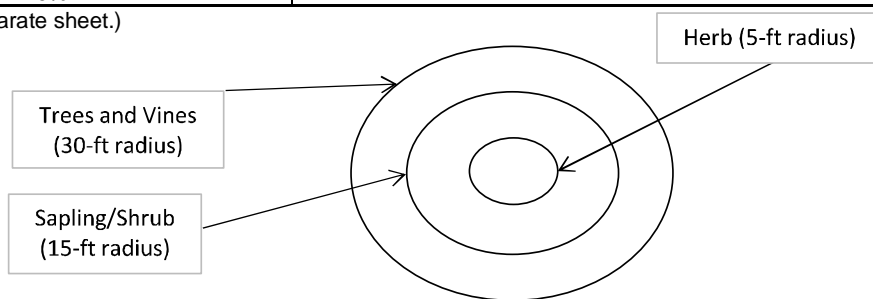
Sapling /Shrub - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present?Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Phragmites australis ws observed along the edges

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/4/2014Sampling point: WL-55, 56**Soil****Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	10YR 3/1	100					organic	many roots
4-16+	10YR 3/1	100					silt loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks:

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 2/4/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-57
 Investigator(s): Glenn Wilson and David Kwasniewski Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): tidal floodplain Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 45' 29.17" Long: 76° 17' 11.49" Datum: WGS 84
 Soil Map Unit Name: Dragston-Urban land complex NWI classification: N/A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	

Remarks: Tidal E2EM5 Wetland (*Phragmites australis* dominant)
 Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location)
 This wetland is located to the north of I-64 within tidal waters
 Portion within overhead utility easement
 Potential sub-surface tidal connection

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)	
Primary Indicators (minimum of one is required; check all that apply)			
<u>X</u> Surface Water (A1)	_____ Aquatic Fauna (B13)	_____ Surface Soil Cracks (B6)	
<u>X</u> High Water Table (A2)	_____ Marl Deposits (B15) (LRR U)	_____ Sparsely Vegetated Concave Surface (B8)	
<u>X</u> Saturation (A3)	_____ Hydrogen Sulfide Odor (C1)	<u>X</u> Drainage Patterns (B10)	
_____ Water Marks (B1)	_____ Oxidized Rhizospheres on Living Roots (C3)	_____ Moss Trim Lines (B16)	
_____ Sediment Deposits (B2)	_____ Presence of Reduced Iron (C4)	_____ Dry-Season Water Table (C2)	
_____ Drift Deposits (B3)	_____ Recent Reduction in Tilled Soils (C6)	_____ Crayfish Burrows (C8)	
_____ Algal Mat or Crust (B4)	_____ Thin Muck Surface (C7)	_____ Saturation Visible on Aerial Imagery (C9)	
_____ Iron Deposits (B5)	_____ Other (Explain in Remarks)	<u>X</u> Geomorphic Position (D2)	
_____ Inundation Visible on Aerial Imagery (B7)		_____ Shallow Aquitard (D3)	
<u>X</u> Water-Stained Leaves (B9)		<u>X</u> FAC-Neutral Test (D5)	
		_____ Sphagnum moss (D8) (LRR T, U)	

Field Observations:

Surface Water Present?	Yes	<u>X</u>	No	<u> </u>	Depth (inches):	<u>2"</u>	Wetland Hydrology Present?	Yes	<u>X</u>	No	<u> </u>
Water Table Present?	Yes	<u>X</u>	No	<u> </u>	Depth (inches):	<u>0"</u>					
Saturation Present?	Yes	<u>X</u>	No	<u> </u>	Depth (inches):	<u>0"</u>					
(includes capillary fringe)											

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/4/2014Sampling point: WL-57**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0 50% of total cover 0% 0%			

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____
13. _____	_____	_____	_____
14. _____	_____	_____	_____
15. _____	_____	_____	_____
16. _____	_____	_____	_____
17. _____	_____	_____	_____
18. _____	_____	_____	_____
19. _____	_____	_____	_____
20. _____	_____	_____	_____
21. _____	_____	_____	_____
22. _____	_____	_____	_____
23. _____	_____	_____	_____
24. _____	_____	_____	_____
25. _____	_____	_____	_____
26. _____	_____	_____	_____
27. _____	_____	_____	_____
28. _____	_____	_____	_____
29. _____	_____	_____	_____
30. _____	_____	_____	_____
31. _____	_____	_____	_____
32. _____	_____	_____	_____
33. _____	_____	_____	_____
34. _____	_____	_____	_____
35. _____	_____	_____	_____
36. _____	_____	_____	_____
37. _____	_____	_____	_____
38. _____	_____	_____	_____
39. _____	_____	_____	_____
40. _____	_____	_____	_____
41. _____	_____	_____	_____
42. _____	_____	_____	_____
43. _____	_____	_____	_____
44. _____	_____	_____	_____
45. _____	_____	_____	_____
46. _____	_____	_____	_____
47. _____	_____	_____	_____
48. _____	_____	_____	_____
49. _____	_____	_____	_____
50. _____	_____	_____	_____
51. _____	_____	_____	_____
52. _____	_____	_____	_____
53. _____	_____	_____	_____
54. _____	_____	_____	_____
55. _____	_____	_____	_____
56. _____	_____	_____	_____
57. _____	_____	_____	_____
58. _____	_____	_____	_____
59. _____	_____	_____	_____
60. _____	_____	_____	_____
61. _____	_____	_____	_____
62. _____	_____	_____	_____
63. _____	_____	_____	_____
64. _____	_____	_____	_____
65. _____	_____	_____	_____
66. _____	_____	_____	_____
67. _____	_____	_____	_____
68. _____	_____	_____	_____
69. _____	_____	_____	_____
70. _____	_____	_____	_____
71. _____	_____	_____	_____
72. _____	_____	_____	_____
73. _____	_____	_____	_____
74. _____	_____	_____	_____
75. _____	_____	_____	_____
76. _____	_____	_____	_____
77. _____	_____	_____	_____
78. _____	_____	_____	_____
79. _____	_____	_____	_____
80. _____	_____	_____	_____
81. _____	_____	_____	_____
82. _____	_____	_____	_____
83. _____	_____	_____	_____
84. _____	_____	_____	_____
85. _____	_____	_____	_____
86. _____	_____	_____	_____
87. _____	_____	_____	_____
88. _____	_____	_____	_____
89. _____	_____	_____	_____
90. _____	_____	_____	_____
91. _____	_____	_____	_____
92. _____	_____	_____	_____
93. _____	_____	_____	_____
94. _____	_____	_____	_____
95. _____	_____	_____	_____
96. _____	_____	_____	_____
97. _____	_____	_____	_____
98. _____	_____	_____	_____
99. _____	_____	_____	_____
100. _____	_____	_____	_____
101. _____	_____	_____	_____
102. _____	_____	_____	_____
103. _____	_____	_____	_____
104. _____	_____	_____	_____
105. _____	_____	_____	_____
106. _____	_____	_____	_____
107. _____	_____	_____	_____
108. _____	_____	_____	_____
109. _____	_____	_____	_____
110. _____	_____	_____	_____
111. _____	_____	_____	_____
112. _____	_____	_____	_____
113. _____	_____	_____	_____
114. _____	_____	_____	_____
115. _____	_____	_____	_____
116. _____	_____	_____	_____
117. _____	_____	_____	_____
118. _____	_____	_____	_____
119. _____	_____	_____	_____
120. _____	_____	_____	_____
121. _____	_____	_____	_____
122. _____	_____	_____	_____
123. _____	_____	_____	_____
124. _____	_____	_____	_____
125. _____	_____	_____	_____
126. _____	_____	_____	_____
127. _____	_____	_____	_____
128. _____	_____	_____	_____
129. _____	_____	_____	_____
130. _____	_____	_____	_____
131. _____	_____	_____	_____
132. _____	_____	_____	_____
133. _____	_____	_____	_____
134. _____	_____	_____	_____
135. _____	_____	_____	_____
136. _____	_____	_____	_____
137. _____	_____	_____	_____
138. _____	_____	_____	_____
139. _____	_____	_____	_____
140. _____	_____	_____	_____
141. _____	_____	_____	_____
142. _____	_____	_____	_____
143. _____	_____	_____	_____
144. _____	_____	_____	_____
145. _____	_____	_____	_____
146. _____	_____	_____	_____
147. _____	_____	_____	_____
148. _____	_____	_____	_____
149. _____	_____	_____	_____
150. _____	_____	_____	_____
151. _____	_____	_____	_____
152. _____	_____	_____	_____
153. _____	_____	_____	_____
154. _____	_____	_____	_____
155. _____	_____	_____	_____
156. _____	_____	_____	_____
157. _____	_____	_____	_____
158. _____	_____	_____	_____
159. _____	_____	_____	_____
160. _____	_____	_____	_____
161. _____	_____	_____	_____
162. _____	_____	_____	_____
163. _____	_____	_____	_____
164. _____	_____	_____	_____
165. _____	_____	_____	_____
166. _____	_____	_____	_____
167. _____	_____	_____	_____
168. _____	_____	_____	_____
169. _____	_____	_____	_____
170. _____	_____	_____	_____
171. _____	_____	_____	_____
172. _____	_____	_____	_____
173. _____	_____	_____	_____
174. _____	_____	_____	_____
175. _____	_____	_____	_____
176. _____	_____	_____	_____
177. _____	_____	_____	_____
178. _____	_____	_____	_____
179. _____	_____	_____	_____
180. _____	_____	_____	_____
181. _____	_____	_____	_____
182. _____	_____	_____	_____
183. _____	_____	_____	_____
184. _____	_____	_____	_____
185. _____	_____	_____	_____
186. _____	_____	_____	_____
187. _____	_____	_____	_____
188. _____	_____	_____	_____
189. _____	_____	_____	_____
190. _____	_____	_____	_____
191. _____	_____	_____	_____
192. _____	_____	_____	_____
193. _____	_____	_____	_____
194. _____	_____	_____	_____
195. _____	_____	_____	_____
196. _____	_____	_____	_____
197. _____	_____	_____	_____
198. _____	_____	_____	_____
199. _____	_____	_____	_____
200. _____	_____	_____	_____
201. _____	_____	_____	_____
202. _____	_____	_____	_____
203. _____	_____	_____	_____
204. _____	_____	_____	_____
205. _____	_____	_____	_____
206. _____	_____	_____	_____
207. _____	_____	_____	_____
208. _____	_____	_____	_____
209. _____	_____	_____	_____
210. _____	_____	_____	_____
211. _____	_____	_____	_____
212. _____	_____	_____	_____
213. _____	_____	_____	_____
214. _____	_____	_____	_____
215. _____	_____	_____	_____
216. _____	_____	_____	_____
217. _____	_____	_____	_____
218. _____	_____	_____	_____
219. _____	_____	_____	_____
220. _____	_____	_____	_____
221. _____	_____	_____	_____
222. _____	_____	_____	_____
223. _____	_____	_____	_____
224. _____	_____	_____	_____
225. _____	_____	_____	_____
226. _____	_____	_____	_____
227. _____	_____	_____	_____
228. _____	_____	_____	_____
229. _____	_____	_____	_____
230. _____	_____	_____	_____
231. _____	_____	_____	_____
232. _____	_____	_____	_____
233. _____	_____	_____	_____
234. _____	_____	_____	_____
235. _____	_____	_____	_____
236. _____	_____	_____	_____
237. _____	_____	_____	_____
238. _____	_____	_____	_____
239. _____	_____	_____	_____
240. _____	_____	_____	_____
241. _____	_____	_____	_____
242. _____	_____	_____	_____
243. _____	_____	_____	_____
244. _____	_____	_____	_____
245. _____	_____	_____	_____
246. _____	_____	_____	_____
247. _____	_____	_____	_____
248. _____	_____	_____	_____
249. _____	_____	_____	_____
250. _____	_____	_____	_____
251. _____	_____	_____	_____
252. _____	_____	_____	_____
253. _____	_____	_____	_____
254. _____	_____	_____	_____
255. _____	_____	_____	_____
256. _____	_____	_____	_____
257. _____	_____	_____	_____
258. _____	_____	_____	_____
259. _____	_____	_____	_____
260. _____	_____	_____	_____
261. _____	_____	_____	_____
262. _____	_____	_____	_____
263. _____	_____	_____	_____
264. _____	_____	_____	_____
265. _____	_____	_____	_____
266. _____	_____	_____	_____
267. _____	_____	_____	_____
268. _____	_____	_____	_____
269. _____	_____	_____	_____
270. _____	_____	_____	_____
271. _____	_____	_____	_____
272. _____	_____	_____	_____
273. _____	_____	_____	_____
274. _____	_____	_____	_____
275. _____	_____	_____	_____
276. _____	_____	_____	_____
277. _____	_____	_____	_____
278. _____	_____	_____	_____
279. _____	_____	_____	_____
280. _____	_____	_____	_____
281. _____	_____	_____	_____
282. _____	_____	_____	_____
283. _____	_____	_____	_____
284. _____	_____	_____	_____
285. _____	_____	_____	_____
286. _____	_____	_____	_____
287. _____	_____	_____	_____
288. _____	_____	_____	_____
289. _____	_____	_____	_____
290. _____	_____	_____	_____
291. _____	_____	_____	_____
292. _____	_____	_____	_____
293. _____	_____	_____	_____
294. _____	_____	_____	_____
295. _____	_____	_____	_____
296. _____	_____	_____	_____
297. _____	_____	_____	_____
298. _____	_____	_____	_____
299. _____	_____	_____	_____
300. _____	_____	_____	_____
301. _____	_____	_____	_____
302. _____	_____	_____	_____
303. _____	_____	_____	_____
304. _____	_____	_____	_____
305. _____	_____	_____	_____
306. _____	_____	_____	_____
307. _____	_____	_____	_____
308. _____	_____	_____	_____
309. _____	_____	_____	_____
310. _____	_____	_____	_____
311. _____	_____	_____	_____
312. _____	_____	_____	_____
313. _____	_____	_____	_____
314. _____	_____	_____	_____
315. _____	_____	_____	_____
316. _____	_____	_____	_____
317. _____	_____	_____	_____
318. _____	_____	_____	_____
319. _____	_____	_____	_____
320. _____	_____	_____	_____
321. _____	_____	_____	_____
322. _____	_____	_____	_____
323. _____	_____	_____	_____
324. _____	_____	_____	_____
325. _____	_____	_____	_____
326. _____	_____	_____	_____
327. _____	_____	_____	_____
328. _____	_____	_____	_____
329. _____	_____	_____	_____
330. _____	_____	_____	_____
331. _____	_____	_____	_____
332. _____	_____	_____	_____
333. _____	_____	_____	_____
334. _____	_____	_____	_____
335. _____	_____	_____	_____
336. _____	_____	_____	_____
337. _____	_____	_____	_____
338. _____	_____	_____	_____
339. _____	_____	_____	_____
340. _____	_____	_____	_____
341. _____	_____	_____	_____
342. _____	_____	_____	_____
343. _____	_____	_____	_____
344. _____	_____	_____	_____
345. _____	_____	_____	_____
346. _____	_____	_____	_____
347. _____	_____	_____	_____
348. _____	_____	_____	_____
349. _____	_____	_____	_____
350. _____	_____	_____	_____
351. _____	_____	_____	_____
352. _____	_____	_____	_____
353. _____	_____	_____	_____
354. _____	_____	_____	_____
355. _____	_____	_____	_____
356. _____	_____	_____	_____
357. _____	_____	_____	_____
358. _____	_____	_____	_____
359. _____	_____	_____	_____
360. _____	_____	_____	_____
361. _____	_____	_____	_____
362. _____	_____	_____	_____
363. _____	_____	_____	_____

Project/Site: I-64 /High Rise Bridge Corridor Study

Sampling date: 2/4/2014

Sampling point: WL-57

Soil**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-5	10YR 3/1	100					loam	many roots
5-10	10YR 5/1	100					loamy sand	roots common
10-15+	10YR 4/1	100					sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks:

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 2/4/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-58
 Investigator(s): Glenn Wilson and David Kwasniewski Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): tidal floodplain Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 45' 25.34" Long: 76° 17' 10.23" Datum: WGS 84
 Soil Map Unit Name: Dragston-Urban land complex and Munden-Urban land complex NWI classification: PEM1R
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	

Remarks: Tidal E2EM Wetland
 Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location)
 This wetland is located to the south of I-64 within tidal waters
 Chesapeake Land Development (Tidal Mitigation Site)

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)	
Primary Indicators (minimum of one is required; check all that apply)			
<u>X</u> Surface Water (A1)	_____ Aquatic Fauna (B13)	_____ Surface Soil Cracks (B6)	
<u>X</u> High Water Table (A2)	_____ Marl Deposits (B15) (LRR U)	_____ Sparsely Vegetated Concave Surface (B8)	
<u>X</u> Saturation (A3)	_____ Hydrogen Sulfide Odor (C1)	<u>X</u> Drainage Patterns (B10)	
_____ Water Marks (B1)	_____ Oxidized Rhizospheres on Living Roots (C3)	_____ Moss Trim Lines (B16)	
_____ Sediment Deposits (B2)	_____ Presence of Reduced Iron (C4)	_____ Dry-Season Water Table (C2)	
_____ Drift Deposits (B3)	_____ Recent Reduction in Tilled Soils (C6)	_____ Crayfish Burrows (C8)	
_____ Algal Mat or Crust (B4)	_____ Thin Muck Surface (C7)	_____ Saturation Visible on Aerial Imagery (C9)	
_____ Iron Deposits (B5)	_____ Other (Explain in Remarks)	<u>X</u> Geomorphic Position (D2)	
_____ Inundation Visible on Aerial Imagery (B7)		_____ Shallow Aquitard (D3)	
<u>X</u> Water-Stained Leaves (B9)		<u>X</u> FAC-Neutral Test (D5)	
		_____ Sphagnum moss (D8) (LRR T, U)	

Field Observations:				Wetland Hydrology Present? Yes <u>X</u> No _____
Surface Water Present?	Yes <u>X</u> No _____	Depth (inches):	<u>2"</u>	
Water Table Present?	Yes <u>X</u> No _____	Depth (inches):	<u>0"</u>	
Saturation Present?	Yes <u>X</u> No _____	Depth (inches):	<u>0"</u>	
(includes capillary fringe)				

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/4/2014Sampling point: WL-58**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Dominance Test worksheet:

Number of Dominant species
That are OBL, FACW, or FAC: 3 (A)

Total number of Dominant
Species across All Strata: 3 (B)

Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is $\leq 3.0^1$
- ☐ 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling /Shrub - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine - All woody vines greater than 3.28 ft in height.

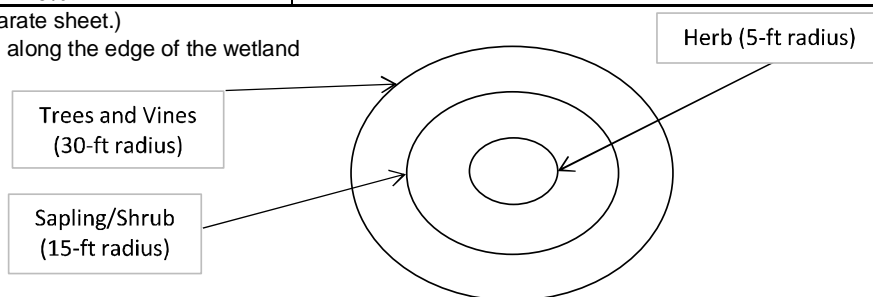
Hydrophytic Vegetation Present?Yes ☒ No ☐

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Baccharis halimifolia</u>	<u>2</u>	<u>Y</u>	<u>FAC</u>
Groundsel tree			
2. <u>Morella cerifera</u>	<u>2</u>	<u>Y</u>	<u>FAC</u>
Southern Bayberry			
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 4	50% of total cover 20% of total cover	2% 1%	_____

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Spartina patens</u>	<u>95</u>	<u>Y</u>	<u>FACW</u>
Salt-Meadow Cord Grass			
2. <u>Juncus roemerianus</u>	<u>10</u>	<u>N</u>	<u>OBL</u>
Roemer's Rush			
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
Total Cover: 105	50% of total cover 20% of total cover	53% 21%	_____

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Remarks: (Include photo numbers here or on a separate sheet.)

Baccharis halimifolia and *Morella cerifera* are found along the edge of the wetland

Project/Site: I-64 /High Rise Bridge Corridor Study

Sampling date: 2/4/2014

Sampling point: WL-58

Soil**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	10YR 3/1	100					clay loam	many roots, organic
3-8	10YR 2/1	100					sandy clay loam	roots common
8-12	10YR 5/1	100					fine sandy clay	
12-16+	10YR 6/1	85	10YR 5/4	15			fine sandy clay	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input checked="" type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks:

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 2/4/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-59, 60, 61
 Investigator(s): Glenn Wilson and David Kwasniewski Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 45' 29.08" Long: 76° 17' 00.88" Datum: WGS 84
 Soil Map Unit Name: Dragston-Urban land-Tomotley complex NWI classification: N/A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	

Remarks: PEM Wetland
 Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location)
 This wetland is located to the north of I-64 and does not have a tidal influence
 Within overhead utility easement
 Potential sub-surface tidal connection (tidal influence was not observed during fieldwork)

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)	
Primary Indicators (minimum of one is required; check all that apply)			
<u>X</u> Surface Water (A1)	_____ Aquatic Fauna (B13)	_____ Surface Soil Cracks (B6)	
<u>X</u> High Water Table (A2)	_____ Marl Deposits (B15) (LRR U)	_____ Sparsely Vegetated Concave Surface (B8)	
<u>X</u> Saturation (A3)	_____ Hydrogen Sulfide Odor (C1)	<u>X</u> Drainage Patterns (B10)	
_____ Water Marks (B1)	_____ Oxidized Rhizospheres on Living Roots (C3)	_____ Moss Trim Lines (B16)	
_____ Sediment Deposits (B2)	_____ Presence of Reduced Iron (C4)	_____ Dry-Season Water Table (C2)	
_____ Drift Deposits (B3)	_____ Recent Reduction in Tilled Soils (C6)	_____ Crayfish Burrows (C8)	
_____ Algal Mat or Crust (B4)	_____ Thin Muck Surface (C7)	_____ Saturation Visible on Aerial Imagery (C9)	
_____ Iron Deposits (B5)	_____ Other (Explain in Remarks)	_____ Geomorphic Position (D2)	
_____ Inundation Visible on Aerial Imagery (B7)		_____ Shallow Aquitard (D3)	
<u>X</u> Water-Stained Leaves (B9)		_____ FAC-Neutral Test (D5)	
		_____ Sphagnum moss (D8) (LRR T, U)	

Field Observations:				Wetland Hydrology Present? Yes <u>X</u> No _____
Surface Water Present?	Yes <u>X</u> No _____	Depth (inches):	<u>3"</u>	
Water Table Present?	Yes <u>X</u> No _____	Depth (inches):	<u>0"</u>	
Saturation Present?	Yes <u>X</u> No _____	Depth (inches):	<u>0"</u>	
(includes capillary fringe)				

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/4/2014Sampling point: WL-59, 60, 61**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Morella cerifera</u> <u>Southern Bayberry</u>	5	Y	FAC
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 5	50% of total cover 20% of total cover	3% 1%	_____

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Dichanthelium spp.</u>	35	Y	UPL
2. <u>Juncus effusus</u> <u>Lamp Rush</u>	25	Y	OBL
3. <u>Rubus spp.</u> <u>Blackberry</u>	10	N	FAC
4. <u>Arundinaria gigantea</u> <u>Giant Cane</u>	5	N	FACW
5. <u>Eupatorium capillifolium</u> <u>Dog-Fennel</u>	5	N	FACU
6. <u>Ludwigia alternifolia</u> <u>Seedbox</u>	3	N	OBL
7. <u>Solidago spp.</u> <u>Goldenrod</u>	2	N	FACU
8. _____	_____	_____	_____
Total Cover: 85	50% of total cover 20% of total cover	43% 17%	_____

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Lonicera japonica</u> <u>Japanese Honeysuckle</u>	2	Y	FAC
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 2	50% of total cover 20% of total cover	1% 0%	_____

Dominance Test worksheet:Number of Dominant species
That are OBL, FACW, or FAC: 3 (A)Total number of Dominant
Species across All Strata: 4 (B)Percent of Dominant Species
That are OBL, FACW, or FAC: 75% (A/B)**Prevalence Index worksheet:**

Total % Cover of Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

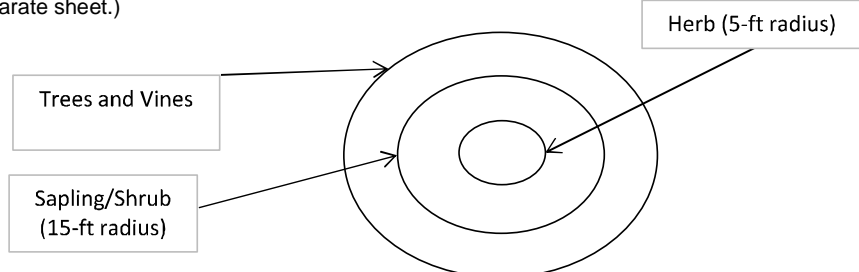
Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- x 2 - Dominance Test is >50%
- 3 - Prevalence Index is $\leq 3.0^1$
- 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present**Definitions of Four Vegetation Strata:****Tree** - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.**Sapling /Shrub** - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.**Woody Vine** - All woody vines greater than 3.28 ft in height.**Hydrophytic Vegetation Present?**Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)



Project/Site: I-64 /High Rise Bridge Corridor Study

Sampling date: 2/4/2014

Sampling point: WL-59, 60, 61

Soil**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	10YR 4/1	100					fine sandy loam	
4-16+	10YR 6/2	90	10YR 5/6	10			fine sandy loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks:

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 2/5/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-62
 Investigator(s): David Kwasniewski and Glenn Wilson Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 45' 29.65" Long: 76° 16' 31.18" Datum: WGS 84
 Soil Map Unit Name: Acredale-Urban Land complex and Tomotley-Urban land complex NWI classification: N/A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Remarks: PFO Wetland Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location) Wetland is located south of I-64 without a tidal influence	

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input checked="" type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Shallow Aquitard (D3)
<input checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)
<input type="checkbox"/> Marl Deposits (B15) (LRR U)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:				Wetland Hydrology Present? Yes <u>X</u> No _____
Surface Water Present?	Yes <u>X</u> No _____	Depth (inches):	3"	
Water Table Present?	Yes <u>X</u> No _____	Depth (inches):	0"	
Saturation Present?	Yes <u>X</u> No _____	Depth (inches):	0"	
(includes capillary fringe)				

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Data recorded in February, with over 0.5" of precip in the previous week.

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/5/2014Sampling point: WL-62**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Liquidambar styraciflua</u> sweet gum	25	Y	FAC
2. <u>Pinus taeda</u> loblolly pine	20	Y	FAC
3. <u>Acer rubrum</u> red maple	15	Y	FAC
4. _____	_____	_____	_____
Total Cover: 60	50% of total cover 20% of total cover	30% 12%	_____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer rubrum</u> red maple	35	Y	FAC
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 35	50% of total cover 20% of total cover	18% 7%	_____

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Toxicodendron radicans</u> poison ivy	40	Y	FAC
2. <u>Cinna arundinacea</u> sweet wood reed	3	N	FACW
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
Total Cover: 43	50% of total cover 20% of total cover	22% 9%	_____

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Lonicera japonica</u> Japanese honeysuckle	3	Y	FAC
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 3	50% of total cover 20% of total cover	2% 1%	_____

Dominance Test worksheet:Number of Dominant species
That are OBL, FACW, or FAC: 6 (A)Total number of Dominant
Species across All Strata: 6 (B)Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)**Prevalence Index worksheet:**

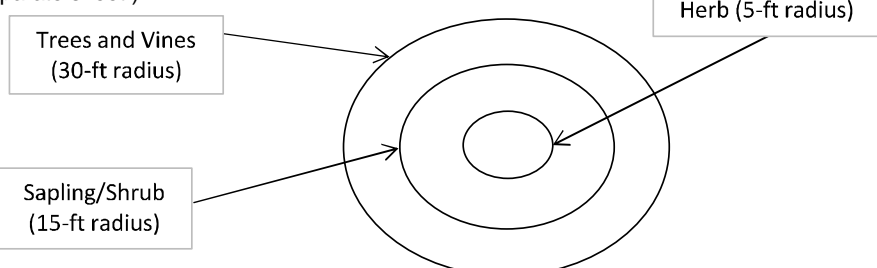
Total % Cover of	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____	(A) _____ (B) _____
Prevalence Index = B/A = _____	

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
 x 2 - Dominance Test is >50%
 3 - Prevalence Index is $\leq 3.0^1$
 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
 Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present**Definitions of Four Vegetation Strata:****Tree** - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.**Sapling /Shrub** - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.**Woody Vine** - All woody vines greater than 3.28 ft in height.**Hydrophytic Vegetation Present?**Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)



Project/Site: I-64 /High Rise Bridge Corridor Study

Sampling date: 2/5/2014

Sampling point: WL-62

Soil

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	10YR 3/1	100					sandy loam	wet
3-8	10YR 5/1	55	10YR 4/4	45			sandy loam	wet
8-12	10YR 5/1	95	10YR 3/4	5			sandy clay loam	wet
12-16	10YR 5/1	98	10YR 3/4	2			clay	wet

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

Indicators for Problematic Hydric Soils³:

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input checked="" type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks: no odors observed

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 10/7/2013
 Applicant/Owner: VDOT State: VA Sampling Point: WL-63
 Investigator(s): David Kwasniewski and Glenn Wilson Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Toe of Slope Local relief (concave, convex, none): concave Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 45' 31.35" Long: 76° 16' 26.14" Datum: WGS 84
 Soil Map Unit Name: Dragston-Urban land-Tomotley complex and Tomotley-Urban land complex NWI classification: N/A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Remarks: PFO Wetland Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location) Wetland is located south of I-64 without a tidal influence This is an unmaintained roadside ditch within a forested area	

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply) <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <input type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> High Water Table (A2) <input checked="" type="checkbox"/> Saturation (A3) <input checked="" type="checkbox"/> Water Marks (B1) <input checked="" type="checkbox"/> Sediment Deposits (B2) <input checked="" type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) </div> <div style="width: 45%;"> <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) (LRR U) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks) </div> </div>	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input checked="" type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input checked="" type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)

Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>6"</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>6"</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
--	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 10/7/2013Sampling point: WL-63**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Liquidambar styraciflua</u> Sweet-gum	40	Y	FAC
2. <u>Acer rubrum</u> Red Maple	35	Y	FAC
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 75	50% of total cover 20% of total cover	38% 15%	_____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer rubrum</u> Red Maple	15	Y	FAC
2. <u>Quercus nigra</u> Water Oak	5	Y	FAC
3. <u>Liquidambar styraciflua</u> Sweet-Gum	2	N	FAC
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 22	50% of total cover 20% of total cover	11% 4%	_____

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Saururus cernuus</u> Lizard's-Tail	60	Y	OBL
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
Total Cover: 60	50% of total cover 20% of total cover	30% 12%	_____

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Smilax rotundifolia</u> Horsebrier	3	Y	FAC
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 3	50% of total cover 20% of total cover	2% 1%	_____

Dominance Test worksheet:Number of Dominant species
That are OBL, FACW, or FAC: 6 (A)Total number of Dominant
Species across All Strata: 6 (B)Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)**Prevalence Index worksheet:**

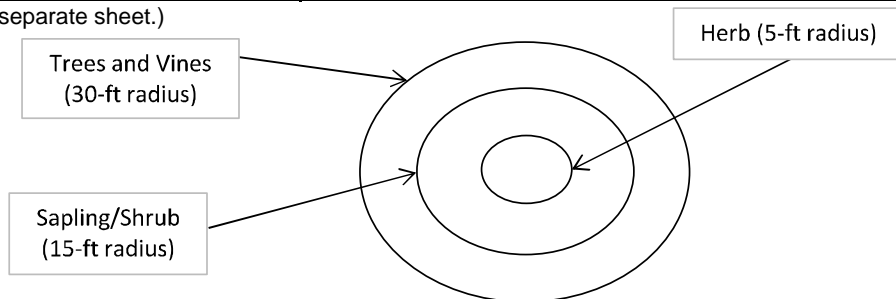
Total % Cover of	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____	(A) _____ (B) _____
Prevalence Index = B/A = _____	

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
 x 2 - Dominance Test is >50%
 3 - Prevalence Index is $\leq 3.0^1$
 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
 Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present**Definitions of Four Vegetation Strata:****Tree** - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.**Sapling /Shrub** - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.**Woody Vine** - All woody vines greater than 3.28 ft in height.**Hydrophytic Vegetation Present?**Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)



Project/Site: I-64 /High Rise Bridge Corridor Study

Sampling date: 10/7/2013

Sampling point: WL-63

Soil**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	Gley1 5/N	90	10YR 3/3	10			Clay loam	moist
2-6	10YR 3/1	100					loam	many roots, moist
6-14+	10YR 4/1	100					sand	medium grain sand, wet

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input checked="" type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks:

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 2/5/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-64
 Investigator(s): Glenn Wilson and David Kwasniewski Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): tidal floodplain Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 45' 44.68" Long: 76° 16' 13.21" Datum: WGS 84
 Soil Map Unit Name: Udorthents-Urban land complex NWI classification: N/A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	

Remarks: PFO Wetland
 Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location)
 This wetland is located to the north of I-64 and does not have a tidal influence
 Adjacent to ramp

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)	
Primary Indicators (minimum of one is required; check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)	<input checked="" type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Moss Trim Lines (B16)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Reduction in Tilled Soils (C6)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input checked="" type="checkbox"/> Water-Stained Leaves (B9)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	
		<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)	

Field Observations:				Wetland Hydrology Present? Yes <u>X</u> No _____
Surface Water Present?	Yes _____ No <u>X</u>	Depth (inches):	<u>-</u>	
Water Table Present?	Yes <u>X</u> No _____	Depth (inches):	<u>0"</u>	
Saturation Present?	Yes <u>X</u> No _____	Depth (inches):	<u>0"</u>	
(includes capillary fringe)				

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/5/2014Sampling point: WL-64**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer rubrum</u> Red Maple	60	Y	FAC
2. <u>Liquidambar styraciflua</u> Sweet-Gum	20	Y	FAC
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 80	50% of total cover 20% of total cover	40% 16%	_____

Dominance Test worksheet:Number of Dominant species
That are OBL, FACW, or FAC: 6 (A)Total number of Dominant
Species across All Strata: 6 (B)Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)**Prevalence Index worksheet:**

Total % Cover of Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is $\leq 3.0^1$
- ☐ 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present**Definitions of Four Vegetation Strata:****Tree** - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.**Sapling /Shrub** - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.**Woody Vine** - All woody vines greater than 3.28 ft in height.**Hydrophytic Vegetation****Present?** Yes X No _____

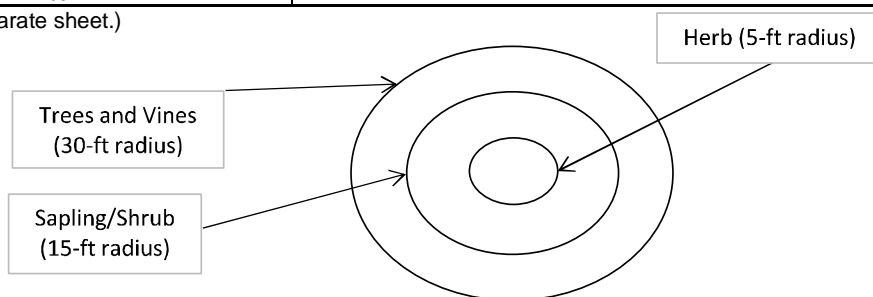
Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Morella cerifera</u> Southern Bayberry	30	Y	FAC
2. <u>Acer rubrum</u> Red Maple	15	Y	FAC
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 45	50% of total cover 20% of total cover	23% 9%	_____

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Juncus effusus</u> Lamp Rush	2	Y	OBL
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
Total Cover: 2	50% of total cover 20% of total cover	1% 0%	_____

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Toxicodendron radicans</u> Eastern Poison Ivy	10	Y	FAC
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 10	50% of total cover 20% of total cover	5% 2%	_____

Remarks: (Include photo numbers here or on a separate sheet.)

Trees are buttressed



Project/Site: I-64 /High Rise Bridge Corridor Study

Sampling date: 2/5/2014

Sampling point: WL-64

Soil**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	10YR 3/2	100					fine sandy loam	
3-8	10YR 4/1	90	10YR 4/4	5			sandy clay loam	
			10YR 5/6	5			sandy clay loam	
8-12	10YR 5/1	90	10YR 4/4	5			sandy clay loam	
			10YR 5/6	5			sandy clay loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input checked="" type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks:

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 2/5/2014
Applicant/Owner: VDOT State: VA Sampling Point: WL-65
Investigator(s): Glenn Wilson and David Kwasniewski Section, Township, Range: _____
Landform (hillslope, terrace, etc.): tidal floodplain Local relief (concave, convex, none): none Slope (%): 0-1%
Subregion (LRR or MLRA): LRR T Lat: 36° 45' 46.82" Long: 76° 16' 11.82" Datum: WGS 84
Soil Map Unit Name: Udorthents-Urban land complex NWI classification: PFO1A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	

Remarks: PFO Wetland
Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location)
This wetland is located to the north of I-64 and does not have a tidal influence

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)	
Primary Indicators (minimum of one is required; check all that apply)			
<u>X</u> Surface Water (A1)	_____ Aquatic Fauna (B13)	_____ Surface Soil Cracks (B6)	
<u>X</u> High Water Table (A2)	_____ Marl Deposits (B15) (LRR U)	_____ Sparsely Vegetated Concave Surface (B8)	
<u>X</u> Saturation (A3)	_____ Hydrogen Sulfide Odor (C1)	<u>X</u> Drainage Patterns (B10)	
_____ Water Marks (B1)	_____ Oxidized Rhizospheres on Living Roots (C3)	_____ Moss Trim Lines (B16)	
_____ Sediment Deposits (B2)	_____ Presence of Reduced Iron (C4)	_____ Dry-Season Water Table (C2)	
_____ Drift Deposits (B3)	_____ Recent Reduction in Tilled Soils (C6)	_____ Crayfish Burrows (C8)	
_____ Algal Mat or Crust (B4)	_____ Thin Muck Surface (C7)	_____ Saturation Visible on Aerial Imagery (C9)	
_____ Iron Deposits (B5)	_____ Other (Explain in Remarks)	_____ Geomorphic Position (D2)	
_____ Inundation Visible on Aerial Imagery (B7)		_____ Shallow Aquitard (D3)	
<u>X</u> Water-Stained Leaves (B9)		<u>X</u> FAC-Neutral Test (D5)	
		_____ Sphagnum moss (D8) (LRR T, U)	

Field Observations:			
Surface Water Present?	Yes <u>X</u> No _____	Depth (inches):	<u>2"</u>
Water Table Present?	Yes <u>X</u> No _____	Depth (inches):	<u>0"</u>
Saturation Present?	Yes <u>X</u> No _____	Depth (inches):	<u>0"</u>
(includes capillary fringe)		Wetland Hydrology Present?	Yes <u>X</u> No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/5/2014Sampling point: WL-65**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer rubrum</u> Red Maple	40	Y	FAC
2. <u>Liquidambar styraciflua</u> Sweet-Gum	15	Y	FAC
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 55	50% of total cover 20% of total cover	28% 11%	_____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer rubrum</u> Red Maple	30	Y	FAC
2. <u>Liquidambar styraciflua</u> Sweet-Gum	5	N	FAC
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 35	50% of total cover 20% of total cover	18% 7%	_____

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Arundinaria gigantea</u> Giant Cane	2	Y	FACW
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
Total Cover: 2	50% of total cover 20% of total cover	1% 0%	_____

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Dominance Test worksheet:

Number of Dominant species
That are OBL, FACW, or FAC: 4 (A)

Total number of Dominant
Species across All Strata: 4 (B)

Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is $\leq 3.0^1$
- ☐ 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

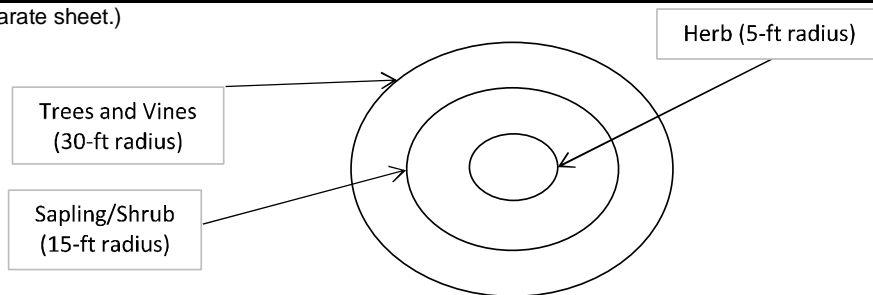
Sapling /Shrub - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present?Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)



Soil**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	10YR 3/2	98	10YR 3/4	2			loam	
3-6	10YR 4/1	90	10YR 3/4	10			loam	
6-10	10YR 5/1	80	10YR 3/4	20			fine sandy loam	
10-12+	10YR 6/1	80	7.5YR 4/6	20			clay	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input checked="" type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks:

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 2/5/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-67
 Investigator(s): Glenn Wilson and David Kwasniewski Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): tidal floodplain Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 45' 44.58" Long: 76° 15' 56.47" Datum: WGS 84
 Soil Map Unit Name: Udorthents-Urban land complex NWI classification: N/A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	

Remarks: PEM Wetland
 Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location)
 This wetland is located to the south of I-64 and does not have a tidal influence
 Adjacent to on ramp, maintained outside of forested area (approximatley 20 feet)

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)	
Primary Indicators (minimum of one is required; check all that apply)			
<u>X</u> Surface Water (A1)	_____ Aquatic Fauna (B13)	_____ Surface Soil Cracks (B6)	
<u>X</u> High Water Table (A2)	_____ Marl Deposits (B15) (LRR U)	_____ Sparsely Vegetated Concave Surface (B8)	
<u>X</u> Saturation (A3)	_____ Hydrogen Sulfide Odor (C1)	<u>X</u> Drainage Patterns (B10)	
_____ Water Marks (B1)	_____ Oxidized Rhizospheres on Living Roots (C3)	_____ Moss Trim Lines (B16)	
_____ Sediment Deposits (B2)	_____ Presence of Reduced Iron (C4)	_____ Dry-Season Water Table (C2)	
<u>X</u> Drift Deposits (B3)	_____ Recent Reduction in Tilled Soils (C6)	<u>X</u> Crayfish Burrows (C8)	
_____ Algal Mat or Crust (B4)	_____ Thin Muck Surface (C7)	_____ Saturation Visible on Aerial Imagery (C9)	
_____ Iron Deposits (B5)	_____ Other (Explain in Remarks)	_____ Geomorphic Position (D2)	
_____ Inundation Visible on Aerial Imagery (B7)		_____ Shallow Aquitard (D3)	
<u>X</u> Water-Stained Leaves (B9)		<u>X</u> FAC-Neutral Test (D5)	
		_____ Sphagnum moss (D8) (LRR T, U)	

Field Observations:				Wetland Hydrology Present? Yes <u>X</u> No _____
Surface Water Present?	Yes <u>X</u> No _____	Depth (inches):	<u>0"</u>	
Water Table Present?	Yes <u>X</u> No _____	Depth (inches):	<u>0"</u>	
Saturation Present?	Yes <u>X</u> No _____	Depth (inches):	<u>0"</u>	
(includes capillary fringe)				

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Water is at the soil surface

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/5/2014Sampling point: WL-67**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer rubrum</u> Red Maple	15	Y	FAC
2. <u>Liquidambar styraciflua</u> Sweet-Gum	15	Y	FAC
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 30	50% of total cover 20% of total cover	15% 6%	_____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer rubrum</u> Red Maple	5	Y	FAC
2. <u>Morella cerifera</u> Southern Bayberry	2	Y	FAC
3. <u>Liquidambar styraciflua</u> Sweet-Gum	2	Y	FAC
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 9	50% of total cover 20% of total cover	5% 2%	_____

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Juncus effusus</u> Lamp Rush	30	Y	OBL
2. <u>Phragmites australis</u> Common Reed	10	Y	FACW
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
Total Cover: 40	50% of total cover 20% of total cover	20% 8%	_____

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Lonicera japonica</u> Japanese Honeysuckle	10	Y	FAC
2. <u>Toxicodendron radicans</u> Eastern Poison Ivy	5	Y	FAC
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 15	50% of total cover 20% of total cover	8% 3%	_____

Dominance Test worksheet:

Number of Dominant species
That are OBL, FACW, or FAC: 9 (A)

Total number of Dominant
Species across All Strata: 9 (B)

Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is $\leq 3.0^1$
- ☐ 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

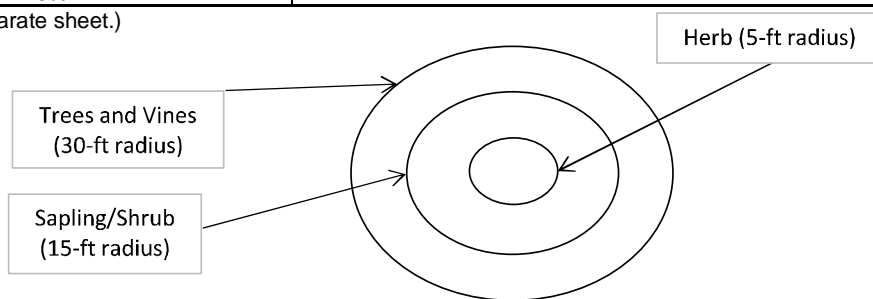
Sapling /Shrub - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present?Yes ☒ No ☐

Remarks: (Include photo numbers here or on a separate sheet.)



Soil**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	10YR 4/1	100					sandy loam	
3-8	10YR 5/1	95	10YR 4/4	5			sandy loam	
8-10	10YR 5/1	90	10YR 4/6	10			sandy clay loam	
10-16+	10YR 4/1	95	10YR 4/4	5			sandy clay	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Stratified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks:

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 2/5/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-68, 69
 Investigator(s): Glenn Wilson and David Kwasniewski Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): tidal floodplain Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 45' 46.57" Long: 76° 15' 51.73" Datum: WGS 84
 Soil Map Unit Name: Tomotley-Urban land-Nimmo complex NWI classification: N/A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	

Remarks: PEM Wetland
 Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location)
 This wetland is located to the south of I-64 and does not have a tidal influence
 Maintained field

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)	
Primary Indicators (minimum of one is required; check all that apply)			
<u>X</u> Surface Water (A1)	_____ Aquatic Fauna (B13)	_____ Surface Soil Cracks (B6)	
<u>X</u> High Water Table (A2)	_____ Marl Deposits (B15) (LRR U)	_____ Sparsely Vegetated Concave Surface (B8)	
<u>X</u> Saturation (A3)	_____ Hydrogen Sulfide Odor (C1)	_____ Drainage Patterns (B10)	
_____ Water Marks (B1)	_____ Oxidized Rhizospheres on Living Roots (C3)	_____ Moss Trim Lines (B16)	
_____ Sediment Deposits (B2)	_____ Presence of Reduced Iron (C4)	_____ Dry-Season Water Table (C2)	
_____ Drift Deposits (B3)	_____ Recent Reduction in Tilled Soils (C6)	_____ Crayfish Burrows (C8)	
_____ Algal Mat or Crust (B4)	_____ Thin Muck Surface (C7)	<u>X</u> Saturation Visible on Aerial Imagery (C9)	
_____ Iron Deposits (B5)	_____ Other (Explain in Remarks)	_____ Geomorphic Position (D2)	
_____ Inundation Visible on Aerial Imagery (B7)		_____ Shallow Aquitard (D3)	
<u>X</u> Water-Stained Leaves (B9)		_____ FAC-Neutral Test (D5)	
		_____ Sphagnum moss (D8) (LRR T, U)	

Field Observations:				Wetland Hydrology Present? Yes <u>X</u> No _____
Surface Water Present?	Yes <u>X</u> No _____	Depth (inches):	<u>3"</u>	
Water Table Present?	Yes <u>X</u> No _____	Depth (inches):	<u>0"</u>	
Saturation Present?	Yes <u>X</u> No _____	Depth (inches):	<u>0"</u>	
(includes capillary fringe)				

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/5/2014Sampling point: WL-68, 69**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Panicum spp.</u>	75	Y	FAC
2. <u>Juncus effusus</u> Lamp Rush	10	N	OBL
3. <u>Ludwigia spp.</u>	10	N	OBL
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
Total Cover: 95	50% of total cover 20% of total cover	48% 19%	_____

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Dominance Test worksheet:

Number of Dominant species
That are OBL, FACW, or FAC: 1 (A)

Total number of Dominant
Species across All Strata: 1 (B)

Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is $\leq 3.0^1$
- ☐ 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling /Shrub - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

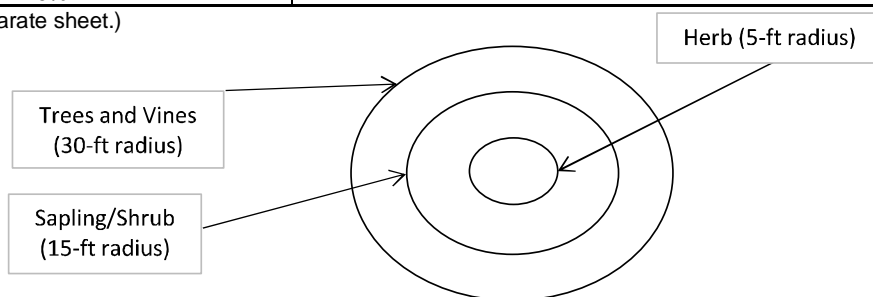
Woody Vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present?

Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

No flowering parts were observed to id species



Soil**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	10YR 5/1	100					sandy loam	many roots
3-8	10YR 5/1	90	10YR 4/6	10			sandy clay loam	
8-14	10YR 6/1	95	10YR 5/4	5			sandy clay loam	
14-16+	10YR 6/1	80	10YR 4/6	20			sandy clay loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks: soils are compacted. Potentially fill material

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 2/5/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-70
 Investigator(s): Glenn Wilson and David Kwasniewski Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): tidal floodplain Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 45' 36.79" Long: 76° 16' 03.36" Datum: WGS 84
 Soil Map Unit Name: Udorthents-Urban land complex NWI classification: N/A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	

Remarks: PEM Wetland (isolated wetland)
 Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location)
 This wetland is located to the north of I-64 and does not have a tidal influence

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)	
Primary Indicators (minimum of one is required; check all that apply)			
<u>X</u> Surface Water (A1)	_____ Aquatic Fauna (B13)	_____ Surface Soil Cracks (B6)	
<u>X</u> High Water Table (A2)	_____ Marl Deposits (B15) (LRR U)	_____ Sparsely Vegetated Concave Surface (B8)	
<u>X</u> Saturation (A3)	_____ Hydrogen Sulfide Odor (C1)	_____ Drainage Patterns (B10)	
_____ Water Marks (B1)	_____ Oxidized Rhizospheres on Living Roots (C3)	_____ Moss Trim Lines (B16)	
_____ Sediment Deposits (B2)	_____ Presence of Reduced Iron (C4)	_____ Dry-Season Water Table (C2)	
<u>X</u> Drift Deposits (B3)	_____ Recent Reduction in Tilled Soils (C6)	_____ Crayfish Burrows (C8)	
_____ Algal Mat or Crust (B4)	_____ Thin Muck Surface (C7)	_____ Saturation Visible on Aerial Imagery (C9)	
_____ Iron Deposits (B5)	_____ Other (Explain in Remarks)	_____ Geomorphic Position (D2)	
_____ Inundation Visible on Aerial Imagery (B7)		_____ Shallow Aquitard (D3)	
<u>X</u> Water-Stained Leaves (B9)		<u>X</u> FAC-Neutral Test (D5)	
		_____ Sphagnum moss (D8) (LRR T, U)	

Field Observations:				Wetland Hydrology Present? Yes <u>X</u> No _____	
Surface Water Present?	Yes <u>X</u> No _____	Depth (inches):	<u>0"</u>		
Water Table Present?	Yes <u>X</u> No _____	Depth (inches):	<u>0"</u>		
Saturation Present?	Yes <u>X</u> No _____	Depth (inches):	<u>0"</u>		
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Water is at soil surface

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/5/2014Sampling point: WL-70**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Cyperus filiculmis</u> Fern Flat Sedge	70	Y	OBL
2. <u>Cinna arundinacea</u> Sweet Wood-Reed	20	N	FACW
3. <u>Aster spp.</u> Maidenhair Spleenwort	15	N	FAC
4. <u>Juncus effusus</u> Lamp Rush	5	N	OBL
5. <u>Cyperus esculentus</u> Chufa	5	N	FAC
6. <u>Plantago lanceolata</u> English Plantain	2	N	FACU
7. _____	_____	_____	_____
Total Cover: 117	50% of total cover 20% of total cover	59% 23%	_____

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Lonicera japonica</u> Japanese Honeysuckle	2	Y	FAC
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 2	50% of total cover 20% of total cover	1% 0%	_____

Dominance Test worksheet:Number of Dominant species
That are OBL, FACW, or FAC: 2 (A)Total number of Dominant
Species across All Strata: 2 (B)Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)**Prevalence Index worksheet:**

Total % Cover of Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

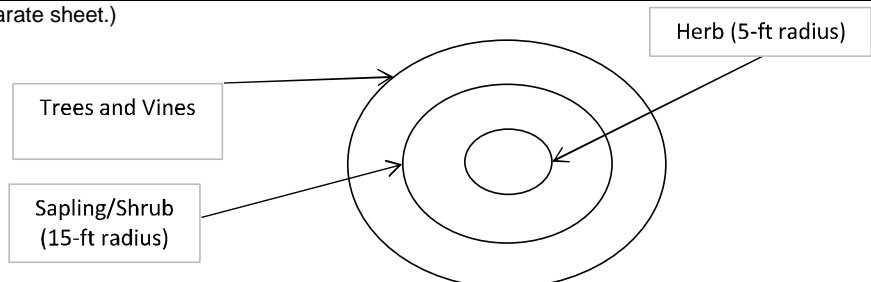
Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- x 2 - Dominance Test is >50%
- 3 - Prevalence Index is $\leq 3.0^1$
- 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present**Definitions of Four Vegetation Strata:****Tree** - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.**Sapling /Shrub** - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.**Woody Vine** - All woody vines greater than 3.28 ft in height.**Hydrophytic Vegetation Present?**Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)



Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 2/5/2014Sampling point: WL-70**Soil****Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	10YR 4/1	100					silt loam	
3-6	10YR 5/1	90	10YR 5/3	10			sandy clay loam	
6-14	10YR 5/1	80	10YR 5/4	10			sandy clay loam	
			10YR 6/3	10			sandy clay loam	
14+	10YR 6/1	80	10YR 5/4	20			sandy clay	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks:

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 4/21/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-71
 Investigator(s): Glenn Wilson and David Kwasniewski Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): toe of slope Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 47' 06.00" Long: 76° 24' 39.75" Datum: WGS 84
 Soil Map Unit Name: Udorthents-Urban land complex NWI classification: N/A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	

Remarks: PEM Wetland
 Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location)
 This wetland is located to the south of I-664 and does not have a tidal influence

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)	
Primary Indicators (minimum of one is required; check all that apply)			
<u>X</u> Surface Water (A1)	<u>X</u> Aquatic Fauna (B13)	_____ Surface Soil Cracks (B6)	
<u>X</u> High Water Table (A2)	_____ Marl Deposits (B15) (LRR U)	_____ Sparsely Vegetated Concave Surface (B8)	
<u>X</u> Saturation (A3)	_____ Hydrogen Sulfide Odor (C1)	<u>X</u> Drainage Patterns (B10)	
_____ Water Marks (B1)	_____ Oxidized Rhizospheres on Living Roots (C3)	_____ Moss Trim Lines (B16)	
_____ Sediment Deposits (B2)	_____ Presence of Reduced Iron (C4)	_____ Dry-Season Water Table (C2)	
<u>X</u> Drift Deposits (B3)	_____ Recent Reduction in Tilled Soils (C6)	_____ Crayfish Burrows (C8)	
_____ Algal Mat or Crust (B4)	_____ Thin Muck Surface (C7)	_____ Saturation Visible on Aerial Imagery (C9)	
_____ Iron Deposits (B5)	_____ Other (Explain in Remarks)	_____ Geomorphic Position (D2)	
_____ Inundation Visible on Aerial Imagery (B7)		_____ Shallow Aquitard (D3)	
<u>X</u> Water-Stained Leaves (B9)		<u>X</u> FAC-Neutral Test (D5)	
		_____ Sphagnum moss (D8) (LRR T, U)	

Field Observations:				Wetland Hydrology Present? Yes <u>X</u> No _____
Surface Water Present?	Yes <u>X</u> No _____	Depth (inches):	<u>3"</u>	
Water Table Present?	Yes <u>X</u> No _____	Depth (inches):	<u>0"</u>	
Saturation Present?	Yes <u>X</u> No _____	Depth (inches):	<u>0"</u>	
(includes capillary fringe)				

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Surface water is found in some areas within the wetland boundary

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 4/21/2014Sampling point: WL-71**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Typha latifolia</u> <u>Broad-Leaf Cat-Tail</u>	60	Y	OBL
2. <u>Juncus effusus</u> <u>Lamp Rush</u>	40	Y	OBL
3. <u>Carex spp.</u> <u>sedge</u>	20	N	FACW
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
Total Cover: 120	50% of total cover 20% of total cover	60% 24%	_____

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Dominance Test worksheet:Number of Dominant species
That are OBL, FACW, or FAC: 2 (A)Total number of Dominant
Species across All Strata: 2 (B)Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)**Prevalence Index worksheet:**

Total % Cover of Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

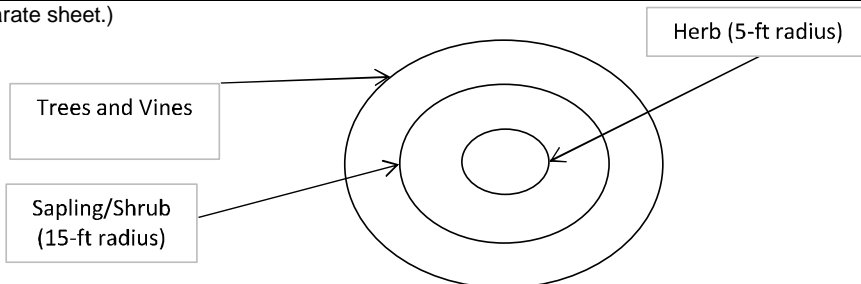
Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0¹
 - 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present**Definitions of Four Vegetation Strata:****Tree** - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.**Sapling /Shrub** - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.**Woody Vine** - All woody vines greater than 3.28 ft in height.**Hydrophytic Vegetation Present?**Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)



Soil**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	10YR 3/1	100					silt loam	many roots
3-8	10YR 5/1	90					sandy clay loam	some roots
	10YR 4/2	10					sandy clay loam	
8-12+	10YR 4/1	49	10YR 5/6	2			sandy clay loam	
	10YR 5/2	49						

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks: Compacted potential fill material

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 4/21/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-72
 Investigator(s): Glenn Wilson and David Kwasniewski Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): drainageway Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 46' 28.03" Long: 76° 21' 34.75" Datum: WGS 84
 Soil Map Unit Name: Tomotley-Deloss complex NWI classification: N/A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	

Remarks: PEM Wetland
 Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location)
 This wetland is located to the north of Cavalier Blvd. and does not have a tidal influence

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)	
Primary Indicators (minimum of one is required; check all that apply)			
<u>X</u> Surface Water (A1)	<u>X</u> Aquatic Fauna (B13)	_____ Surface Soil Cracks (B6)	
<u>X</u> High Water Table (A2)	_____ Marl Deposits (B15) (LRR U)	_____ Sparsely Vegetated Concave Surface (B8)	
<u>X</u> Saturation (A3)	_____ Hydrogen Sulfide Odor (C1)	<u>X</u> Drainage Patterns (B10)	
_____ Water Marks (B1)	_____ Oxidized Rhizospheres on Living Roots (C3)	_____ Moss Trim Lines (B16)	
_____ Sediment Deposits (B2)	_____ Presence of Reduced Iron (C4)	_____ Dry-Season Water Table (C2)	
<u>X</u> Drift Deposits (B3)	_____ Recent Reduction in Tilled Soils (C6)	_____ Crayfish Burrows (C8)	
_____ Algal Mat or Crust (B4)	_____ Thin Muck Surface (C7)	_____ Saturation Visible on Aerial Imagery (C9)	
_____ Iron Deposits (B5)	_____ Other (Explain in Remarks)	_____ Geomorphic Position (D2)	
_____ Inundation Visible on Aerial Imagery (B7)		_____ Shallow Aquitard (D3)	
<u>X</u> Water-Stained Leaves (B9)		<u>X</u> FAC-Neutral Test (D5)	
		_____ Sphagnum moss (D8) (LRR T, U)	

Field Observations:			
Surface Water Present?	Yes <u>X</u> No _____	Depth (inches):	<u>3"</u>
Water Table Present?	Yes <u>X</u> No _____	Depth (inches):	<u>0"</u>
Saturation Present?	Yes <u>X</u> No _____	Depth (inches):	<u>0"</u>
(includes capillary fringe)		Wetland Hydrology Present?	Yes <u>X</u> No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Surface water is found within the wetland boudary

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 4/21/2014Sampling point: WL-72**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Dominance Test worksheet:Number of Dominant species
That are OBL, FACW, or FAC: 4 (A)Total number of Dominant
Species across All Strata: 4 (B)Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)**Prevalence Index worksheet:**

Total % Cover of Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Morella cerifera</u> <u>Southern Bayberry</u>	<u>2</u>	<u>Y</u>	<u>FAC</u>
2. <u>Acer rubrum</u> <u>Red maple</u>	<u>2</u>	<u>Y</u>	<u>FAC</u>
3. <u>Clethra alnifolia</u> <u>Coastal Sweet-Pepperbush</u>	<u>2</u>	<u>Y</u>	<u>FACW</u>
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 6	50% of total cover 20% of total cover	3% 1%	_____

Hydrophytic Vegetation Indicators:

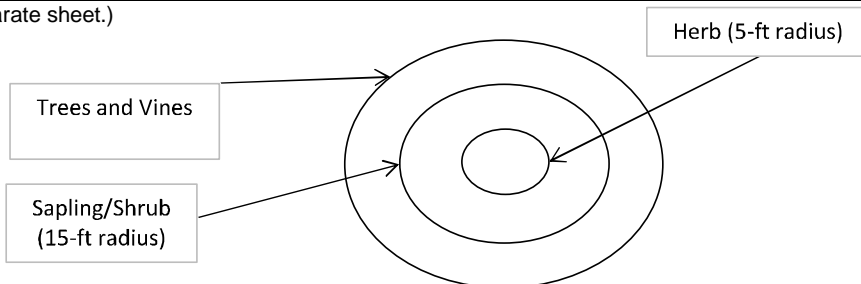
- 1 - Rapid Test for Hydrophytic Vegetation
x 2 - Dominance Test is >50%
3 - Prevalence Index is $\leq 3.0^1$
4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present**Definitions of Four Vegetation Strata:****Tree** - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.**Sapling /Shrub** - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.**Woody Vine** - All woody vines greater than 3.28 ft in height.**Hydrophytic Vegetation Present?**Yes X No _____

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Arundinaria gigantea</u> <u>Giant Cane</u>	<u>40</u>	<u>Y</u>	<u>FACW</u>
2. <u>Woodwardia areolata</u> <u>Netted Chain Fern</u>	<u>10</u>	<u>N</u>	<u>OBL</u>
3. <u>Saururus cernuus</u> <u>Lizard's-Tail</u>	<u>10</u>	<u>N</u>	<u>OBL</u>
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
Total Cover: 60	50% of total cover 20% of total cover	30% 12%	_____

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Remarks: (Include photo numbers here or on a separate sheet.)



Soil**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-5	10YR 2/1	100					silt loam	saturated
5-15+	10YR 5/1	100					sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Stratified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks:

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 4/21/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-73
 Investigator(s): Glenn Wilson and David Kwasniewski Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 46' 10.44" Long: 76° 21' 39.40" Datum: WGS 84
 Soil Map Unit Name: Tomotley-Deloss complex NWI classification: N/A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	

Remarks: PEM Wetland
 Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location)
 This wetland is located to the east of I-64 off ramp and does not have a tidal influence
 Within a utility easement

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)	
Primary Indicators (minimum of one is required; check all that apply)			
<u>X</u> Surface Water (A1)	_____ Aquatic Fauna (B13)	_____ Surface Soil Cracks (B6)	
<u>X</u> High Water Table (A2)	_____ Marl Deposits (B15) (LRR U)	_____ Sparsely Vegetated Concave Surface (B8)	
<u>X</u> Saturation (A3)	_____ Hydrogen Sulfide Odor (C1)	<u>X</u> Drainage Patterns (B10)	
_____ Water Marks (B1)	_____ Oxidized Rhizospheres on Living Roots (C3)	_____ Moss Trim Lines (B16)	
_____ Sediment Deposits (B2)	_____ Presence of Reduced Iron (C4)	_____ Dry-Season Water Table (C2)	
_____ Drift Deposits (B3)	_____ Recent Reduction in Tilled Soils (C6)	_____ Crayfish Burrows (C8)	
_____ Algal Mat or Crust (B4)	_____ Thin Muck Surface (C7)	_____ Saturation Visible on Aerial Imagery (C9)	
_____ Iron Deposits (B5)	_____ Other (Explain in Remarks)	_____ Geomorphic Position (D2)	
_____ Inundation Visible on Aerial Imagery (B7)		_____ Shallow Aquitard (D3)	
<u>X</u> Water-Stained Leaves (B9)		<u>X</u> FAC-Neutral Test (D5)	
		_____ Sphagnum moss (D8) (LRR T, U)	

Field Observations:				Wetland Hydrology Present? Yes <u>X</u> No _____	
Surface Water Present?	Yes <u>X</u> No _____	Depth (inches):	<u>2"</u>		
Water Table Present?	Yes <u>X</u> No _____	Depth (inches):	<u>0"</u>		
Saturation Present?	Yes <u>X</u> No _____	Depth (inches):	<u>0"</u>		
(includes capillary fringe)					

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 4/21/2014Sampling point: WL-73**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Phragmites australis</u> Common Reed	30	Y	FACW
2. <u>Carex spp.</u> Sedge	30	Y	FACW
3. <u>Microstegium vimineum</u> Japanese Stilt Grass	15	N	FAC
4. <u>Juncus effusus</u> Lamp Rush	15	N	OBL
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
Total Cover: 90	50% of total cover 20% of total cover	45% 18%	_____

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Dominance Test worksheet:Number of Dominant species
That are OBL, FACW, or FAC: 2 (A)Total number of Dominant
Species across All Strata: 2 (B)Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)**Prevalence Index worksheet:**

Total % Cover of Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

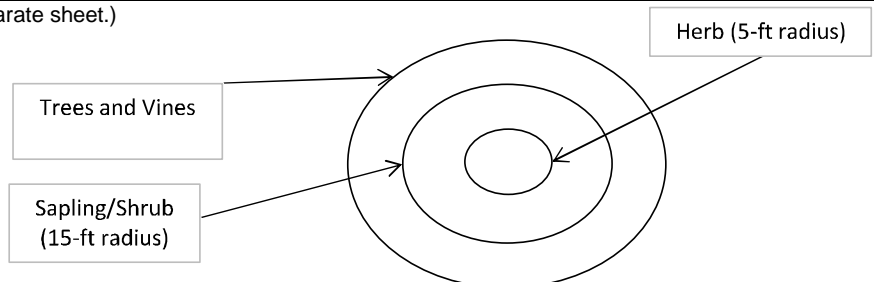
Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- x 2 - Dominance Test is >50%
- 3 - Prevalence Index is $\leq 3.0^1$
- 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present**Definitions of Four Vegetation Strata:****Tree** - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.**Sapling /Shrub** - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.**Woody Vine** - All woody vines greater than 3.28 ft in height.**Hydrophytic Vegetation Present?**Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)



Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 4/21/2014Sampling point: WL-73**Soil****Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-5	10YR 2/1	100					loam	
5-15	10YR 3/1	100					sandy loam	
15+	10YR 5/1	100					sandy clay loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks:

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 4/21/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-74
 Investigator(s): Glenn Wilson and David Kwasniewski Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 46' 12.61" Long: 76° 21' 37.16" Datum: WGS 84
 Soil Map Unit Name: Tomotley-Deloss complex NWI classification: PFO4Ed
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	

Remarks: PFO Wetland
 Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location)
 This wetland is located to the east of I-64 off ramp and does not have a tidal influence

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)	
Primary Indicators (minimum of one is required; check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Moss Trim Lines (B16)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Reduction in Tilled Soils (C6)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Water-Stained Leaves (B9)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	
		<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)	

Field Observations:			
Surface Water Present?	Yes _____ No <u>X</u>	Depth (inches):	<u>-</u>
Water Table Present?	Yes <u>X</u> No _____	Depth (inches):	<u>3"</u>
Saturation Present?	Yes <u>X</u> No _____	Depth (inches):	<u>3"</u>
(includes capillary fringe)			
		Wetland Hydrology Present? Yes <u>X</u> No _____	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 4/21/2014Sampling point: WL-74**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u><i>Pinus taeda</i></u>	30	Y	FAC
<u>Loblolly Pine</u>			
2. <u><i>Acer rubrum</i></u>	25	Y	FAC
<u>Red maple</u>			
3. <u><i>Liquidambar styraciflua</i></u>	10	N	FAC
<u>Sweet-Gum</u>			
4. <u><i>Quercus nigra</i></u>	5	N	FAC
<u>Water Oak</u>			
Total Cover: 70	50% of total cover	35%	
	20% of total cover	14%	

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u><i>Clethra alnifolia</i></u>	20	Y	FACW
<u>Coastal Sweet-Pepperbush</u>			
2. <u><i>Quercus nigra</i></u>	15	Y	FAC
<u>Water Oak</u>			
3. <u><i>Magnolia grandiflora</i></u>	2	N	FAC
<u>Southern Magnolia</u>			
4. _____			
5. _____			
Total Cover: 37	50% of total cover	19%	
	20% of total cover	7%	

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u><i>Pinus taeda</i></u>	10	Y	FAC
<u>Loblolly Piine</u>			
2. <u><i>Toxicodendron radicans</i></u>	5	Y	FAC
<u>Eastern Poison Ivy</u>			
3. <u><i>Smilax rotundifolia</i></u>	3	N	FAC
<u>Horsebrier</u>			
4. _____			
5. _____			
6. _____			
7. _____			
Total Cover: 18	50% of total cover	9%	
	20% of total cover	4%	

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
Total Cover: 0	50% of total cover	0%	
	20% of total cover	0%	

Dominance Test worksheet:Number of Dominant species
That are OBL, FACW, or FAC: 6 (A)Total number of Dominant
Species across All Strata: 6 (B)Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)**Prevalence Index worksheet:**

Total % Cover of Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is $\leq 3.0^1$
 - 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present**Definitions of Four Vegetation Strata:****Tree** - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.**Sapling /Shrub** - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.**Woody Vine** - All woody vines greater than 3.28 ft in height.**Hydrophytic Vegetation Present?**Yes X No _____

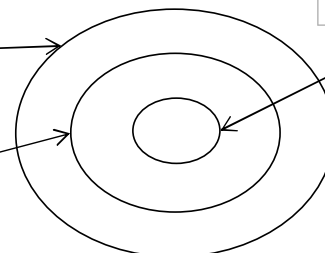
Remarks: (Include photo numbers here or on a separate sheet.)

Pinus taeda tree stratum is more dominant in the southeast portion of the wetland

Trees and Vines

Sapling/Shrub
(15-ft radius)

Herb (5-ft radius)



Project/Site: I-64 /High Rise Bridge Corridor Study

Sampling date: 4/21/2014

Sampling point: WL-74

Soil

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-9	10YR 2/1	100					loam	
9-14	10YR 4/1	100					fine sandy loam	
14-17	10YR 5/1	100					fine sandy loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

Indicators for Problematic Hydric Soils³:

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks:

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 4/22/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-75
 Investigator(s): Glenn Wilson and David Kwasniewski Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): toe of slope/flat Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 45' 24.25" Long: 76° 16' 23.32" Datum: WGS 84
 Soil Map Unit Name: Tomotley-Urban land complex NWI classification: PSS1B
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil X, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	

Remarks: PEM Wetland
 Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location)
 This wetland is located to the south of I-64 and west of Great Bridge Blvd. and does not have a tidal influence
 This area has been resently disturbedby roadway improvements and is within a utility easement

HYDROLOGY

Wetland Hydrology Indicators:				Secondary Indicators (minimum of two required)	
Primary Indicators (minimum of one is required; check all that apply)					
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Surface Soil Cracks (B6)			
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)			
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)			
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Moss Trim Lines (B16)			
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Dry-Season Water Table (C2)			
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Reduction in Tilled Soils (C6)	<input type="checkbox"/> Crayfish Burrows (C8)			
<input checked="" type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)			
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)			
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input type="checkbox"/> Shallow Aquitard (D3)			
<input type="checkbox"/> Water-Stained Leaves (B9)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)			
		<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)			
Field Observations:					
Surface Water Present? Yes <u>X</u> No _____	Depth (inches): <u>0-3"</u>	Wetland Hydrology Present? Yes <u>X</u> No _____			
Water Table Present? Yes <u>X</u> No _____	Depth (inches): <u>0"</u>				
Saturation Present? Yes <u>X</u> No _____	Depth (inches): <u>0"</u>				
(includes capillary fringe)					
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:					

Remarks: Surface water is found within the wetland boudary
 Depressed area from the surrounding landscape

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 4/22/2014Sampling point: WL-75**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Salix nigra</u> Black Willow	2	Y	OBL
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 2	50% of total cover 20% of total cover	1% 0%	_____

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Juncus effusus</u> Lamp Rush	60	Y	OBL
2. <u>Phragmites australis</u> Common Reed	15	N	FACW
3. <u>Carex spp.</u> Sedge	15	N	FACW
4. <u>Persicaria spp.</u> Smartweed	5	N	FACW
5. <u>Salix nigra</u> Black Willow	2	N	OBL
6. <u>Andropogon spp.</u> Bluestem	1	N	FAC
7. _____	_____	_____	_____
Total Cover: 98	50% of total cover 20% of total cover	49% 20%	_____

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Dominance Test worksheet:Number of Dominant species
That are OBL, FACW, or FAC: 2 (A)Total number of Dominant
Species across All Strata: 2 (B)Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)**Prevalence Index worksheet:**

Total % Cover of Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

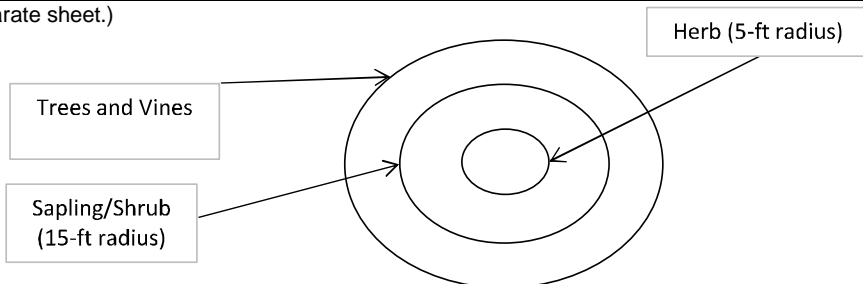
Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
 - x 2 - Dominance Test is >50%
 - 3 - Prevalence Index is $\leq 3.0^1$
 - 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present**Definitions of Four Vegetation Strata:****Tree** - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.**Sapling /Shrub** - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.**Woody Vine** - All woody vines greater than 3.28 ft in height.**Hydrophytic Vegetation Present?**Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)



Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 4/22/2014Sampling point: WL-75**Soil****Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-6	10YR 4/3	100					sand	
6-17+	2.5Y 4/2	100					sand	some clay/fill
	10YR 6/1	90	10YR 5/6	10				clay lens 10%

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Statified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input checked="" type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks: Resently disturbed soils due to roadway improvements

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 4/22/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-76
 Investigator(s): Glenn Wilson and David Kwasniewski Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): toe of slope/flat Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 46' 03.20" Long: 76° 15' 46.66" Datum: WGS 84
 Soil Map Unit Name: Tomotley-Urban land-Nimmo complex NWI classification: N/A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil X, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	

Remarks: PEM Wetland
 Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location)
 This wetland is located west of I-64 and does not have a tidal influence
 Adjacent to I-64 and soundwall

HYDROLOGY

Wetland Hydrology Indicators:				Secondary Indicators (minimum of two required)	
Primary Indicators (minimum of one is required; check all that apply)					
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Surface Soil Cracks (B6)			
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)			
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)			
<input type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Moss Trim Lines (B16)			
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Dry-Season Water Table (C2)			
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Reduction in Tilled Soils (C6)	<input type="checkbox"/> Crayfish Burrows (C8)			
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)			
<input checked="" type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)			
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input type="checkbox"/> Shallow Aquitard (D3)			
<input type="checkbox"/> Water-Stained Leaves (B9)		<input type="checkbox"/> FAC-Neutral Test (D5)			

Field Observations:				Wetland Hydrology Present?	
Surface Water Present? Yes <u>X</u> No _____	Depth (inches): <u>0-2"</u>				
Water Table Present? Yes <u>X</u> No _____	Depth (inches): <u>0"</u>				
Saturation Present? Yes <u>X</u> No _____	Depth (inches): <u>0"</u>			Yes <u>X</u> No _____	

(includes capillary fringe)

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Surface water is found within the wetland boundary
 Depressed area from the surrounding landscape

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 4/22/2014Sampling point: WL-76**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Juncus effusus</u> Lamp Rush	50	Y	OBL
2. <u>Typha latifolia</u> Broad-Leaf Cat-Tail	15	Y	OBL
3. <u>Phragmites australis</u> Common Reed	5	N	FACW
4. <u>Galium spp.</u> Bedstraw	5	N	FACU
5. <u>Scirpus cyperinus</u> Cottongrass Bulrush	2	N	OBL
6. _____	_____	_____	_____
7. _____	_____	_____	_____
Total Cover: 77	50% of total cover 20% of total cover	39% 15%	_____

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
Total Cover: 0	50% of total cover 20% of total cover	0% 0%	_____

Dominance Test worksheet:Number of Dominant species
That are OBL, FACW, or FAC: 2 (A)Total number of Dominant
Species across All Strata: 2 (B)Percent of Dominant Species
That are OBL, FACW, or FAC: 100% (A/B)**Prevalence Index worksheet:**

Total % Cover of Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

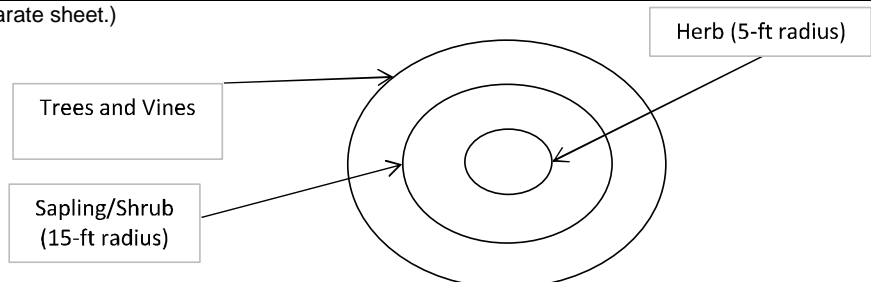
Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is $\leq 3.0^1$
 - 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present**Definitions of Four Vegetation Strata:****Tree** - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.**Sapling /Shrub** - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.**Woody Vine** - All woody vines greater than 3.28 ft in height.**Hydrophytic Vegetation Present?**Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)



Soil**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	10YR 6/1	100					silty clay loam	
3-5	10YR 6/1	85	10YR 5/6	15			sandy clay loam	oxidized rhizospheres
5-8	10YR 6/1	100					clay	
8-9	10YR 6/1	95	10YR 4/6	5			sandy clay loam	
9-15+	10YR 5/1	100					loamy sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Stratified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks:

Wetland Determination Data Form- Atlantic and Gulf Coastal Plain Region

Project/Site: I-64 /High Rise Bridge Corridor Study City/County: City of Chesapeake Sampling Date: 4/22/2014
 Applicant/Owner: VDOT State: VA Sampling Point: WL-77-78
 Investigator(s): Glenn Wilson and David Kwasniewski Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR T Lat: 36° 46' 25.38" Long: 76° 16' 32.31" Datum: WGS 84
 Soil Map Unit Name: Tomotley-Urban land-Nimmo complex NWI classification: PFO1B
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS-Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area Within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	

Remarks: PFO Wetland
 Wetland lat and long were taken approximately in the middle of the wetland (not soil bore location)
 This wetland is located to the east of I-464 and does not have a tidal influence

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)	
Primary Indicators (minimum of one is required; check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Moss Trim Lines (B16)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Reduction in Tilled Soils (C6)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input checked="" type="checkbox"/> Water-Stained Leaves (B9)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	
		<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)	

Field Observations:				Wetland Hydrology Present? Yes <u> X </u> No <u> </u>						
Surface Water Present?	Yes	<u> </u>	No					<u> X </u>	Depth (inches):	<u> - </u>
Water Table Present?	Yes	<u> </u>	No					<u> X </u>	Depth (inches):	<u> - </u>
Saturation Present?	Yes	<u> X </u>	No					<u> </u>	Depth (inches):	<u> 0-6" </u>
(includes capillary fringe)										

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 4/22/2014Sampling point: WL-77-78**Vegetation (Four Strata) - Use scientific names of plants.**

Tree Stratum (Plot sizes: ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer rubrum</u>	<u>40</u>	<u>Y</u>	<u>FAC</u>
<u>Red maple</u>			
2. <u>Liquidambar styraciflua</u>	<u>40</u>	<u>Y</u>	<u>FAC</u>
<u>Sweet-Gum</u>			
3. _____			
4. _____			
Total Cover: <u>80</u>	50% of total cover	40%	
	20% of total cover	16%	

Sapling /Shrub Stratum (ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer rubrum</u>	<u>10</u>	<u>Y</u>	<u>FAC</u>
<u>Red maple</u>			
2. _____			
3. _____			
4. _____			
5. _____			
Total Cover: <u>10</u>	50% of total cover	5%	
	20% of total cover	2%	

Herb Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Smilax rotundifolia</u>	<u>30</u>	<u>Y</u>	<u>FAC</u>
<u>Horsebrier</u>			
2. <u>Lonicera japonica</u>	<u>30</u>	<u>Y</u>	<u>FACU</u>
<u>Japanese Honeysuckle</u>			
3. <u>Toxicodendron radicans</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>
<u>Eastern Poison Ivy</u>			
4. <u>Parthenocissus quinquefolia</u>	<u>10</u>	<u>N</u>	<u>FACU</u>
<u>Virginia-Creeper</u>			
5. <u>Juncus effusus</u>	<u>2</u>	<u>N</u>	<u>OBL</u>
<u>Lamp Rush</u>			
6. _____			
7. _____			
Total Cover: <u>92</u>	50% of total cover	46%	
	20% of total cover	18%	

Woody Vine Stratum ()	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
Total Cover: <u>0</u>	50% of total cover	0%	
	20% of total cover	0%	

Dominance Test worksheet:Number of Dominant species
That are OBL, FACW, or FAC: 5 (A)Total number of Dominant
Species across All Strata: 6 (B)Percent of Dominant Species
That are OBL, FACW, or FAC: 83% (A/B)**Prevalence Index worksheet:**

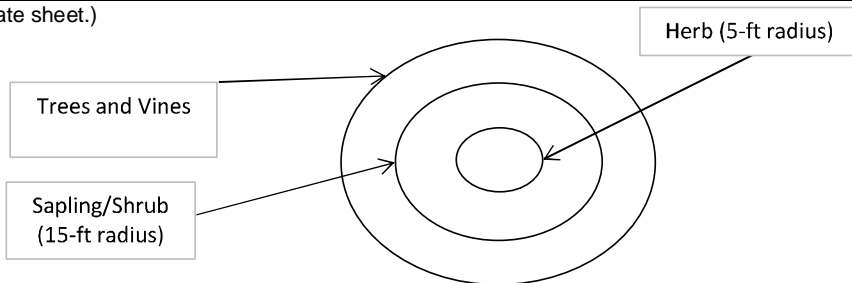
Total % Cover of	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)
Prevalence Index = B/A = _____	

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
 x 2 - Dominance Test is >50%
 3 - Prevalence Index is ≤ 3.0 ¹
 4 - Morphological Adaptations¹ (Provide supporting data and Remarks or on a separate sheet)
 Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present**Definitions of Four Vegetation Strata:****Tree** - Woody plants, excluding vines, 3in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.**Sapling /Shrub** - Woody plants, excluding vines, less than 3in. DBH and greater than 3.28 ft (1m) tall.**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.**Woody Vine** - All woody vines greater than 3.28 ft in height.**Hydrophytic
Vegetation
Present?**Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)



Project/Site: I-64 /High Rise Bridge Corridor StudySampling date: 4/22/2014Sampling point: WL-77-78**Soil****Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	10YR 2/1	100					silt loam	moist
3-10	10YR 4/1	98	10YR 4/6	2			clay loam	
10-16	10YR 6/1	80	10YR 5/6	20			sandy clay loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Stratified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface(F6)	<input type="checkbox"/> (MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T, U)
<input type="checkbox"/> 1cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR, O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? YES ☒ No ☐

Remarks:

APPENDIX C: UNIFIED STREAM METHODOLOGY FORMS

Stream Assessment Form (Form 1)

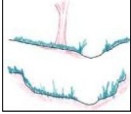
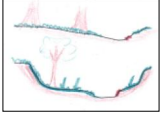
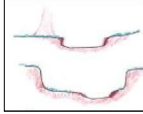
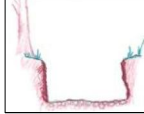

Unified Stream Methodology for use in Virginia

For use in Wadeable channels classified as intermittent or perennial

Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR #	Impact/SAR length	Impact Factor
45612-001	I-64 / High Rise Bridge Corridor Study	Chesapeake	R3	0208020802	2/5/2014	1	1321	N/A

Name(s) of Evaluator(s)	Stream Name and Information
Glenn Wilson & Dave Kwasniewski	Tributary of Newton Creek

1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation)

Channel Condition	Conditional Category				
	Optimal	Suboptimal	Marginal	Poor	Severe
					
	Very little incision or active erosion; 80-100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient sediment deposition covers less than 10% of bottom.	Slightly incised, few areas of active erosion or unprotected banks. Majority of banks are stable (60-80%). Vegetative protection or natural rock prominent (60-80%) AND/OR Depositional features contribute to stability. The bankfull and low flow channels are well defined. Stream likely has access to bankfull benches, or newly developed floodplains along portions of the reach. Transient sediment covers 10-40% of the stream bottom.	Often incised, but less than Severe or Poor. Banks more stable than Severe or Poor due to lower bank slopes. Erosion may be present on 40-60% of both banks. Vegetative protection on 40-60% of banks. Streambanks may be vertical or undercut. AND/OR 40-60% of stream is covered by sediment. Sediment may be temporary/transient, contribute to instability. Deposition that contributes to stability, may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and depositional features which contribute to stability.	Overwidened/incised. Vertically/laterally unstable. Likely to widen further. Majority of both banks are near vertical. Erosion present on 60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in nature, and contributing to instability. AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sediment deposition is absent.	Deeply incised (or excavated), vertical/lateral instability. Severe incision, flow contained within the banks. Streambed below average rooting depth, majority of banks vertical/undercut. Vegetative protection present on less than 20% of banks, is not preventing erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel. Greater than 80% of stream bed is covered by deposition, contributing to instability. Multiple tread channels and/or subterranean flow.
Score	3	2.4	2	1.6	1

CI

2.0

NOTES>>
Grassy banks along cemetery property downstream of double box culvert

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

Conditional Category								NOTES>>
Riparian Buffers	Optimal	Suboptimal		Marginal		Poor		
	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and a non-maintained understory. Wetlands located within the riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	
			High	Low	High	Low	High	
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5	
<div>1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors.</div> <div>2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.</div> <div>3. Enter the % Riparian Area and Score for each riparian category in the blocks below.</div>								
						Ensure the sums of % Riparian Blocks equal 100		
Right Bank	% Riparian Area>	50%	50%				100%	
	Score >	1.2	0.6					
CI= (Sum % RA * Scores*0.01)/2								
Left Bank	% Riparian Area>	50%	50%				100%	
	Score >	1.5	0.6					
Rt Bank CI > 0.90								
Lt Bank CI > 1.05								

3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddedness; shade; undercut banks; root mats; SAV; riffle pools complexes, stable features.

Instream Habitat/ Available Cover	Conditional Category				NOTES>>some leafy debris; some undercut banks; trees at toe of slope
	Optimal	Suboptimal	Marginal	Poor	
	Habitat elements are typically present in greater than 50% of the reach.	Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of populations.	Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of populations.	Habitat elements listed above are lacking or are unstable. Habitat elements are typically present in less than 10% of the reach.	
Score	1.5	1.2	0.9	0.5	

CI

0.90

Stream Impact Assessment Form Page 2

Project #	Applicant	Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
45612-001	VDOT	Chesapeake	R3	0208020802	2/5/2014	1	1321	N/A

4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock

Channel Alteration	Conditional Category				
	Negligible	Minor	Moderate		Severe
	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.
SCORE	1.5	1.3	1.1	0.9	0.7

NOTES>>double box culvert and riprap along banks upstream; maintained banks along cemetery; bridge over stream in cemetery

1.10

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

1.00

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

INSERT PHOTOS:

Photo of SAR 1 looking downstream.



DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1)

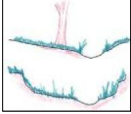
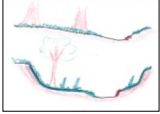
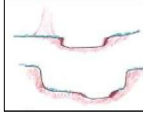
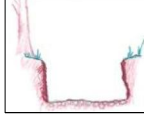

Unified Stream Methodology for use in Virginia

For use in Wadeable channels classified as intermittent or perennial

Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR #	Impact/SAR length	Impact Factor
45612-001	I-64 / High Rise Bridge Corridor Study	Chesapeake	R4	0208020802	2/5/2014	2	315	N/A

Name(s) of Evaluator(s)	Stream Name and Information
Glenn Wilson & Dave Kwasniewski	Tributary of Newton Creek

1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation)

Channel Condition	Conditional Category				
	Optimal	Suboptimal	Marginal	Poor	Severe
					
	Very little incision or active erosion; 80-100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient sediment deposition covers less than 10% of bottom.	Slightly incised, few areas of active erosion or unprotected banks. Majority of banks are stable (60-80%). Vegetative protection or natural rock prominent (60-80%) AND/OR Depositional features contribute to stability. The bankfull and low flow channels are well defined. Stream likely has access to bankfull benches, or newly developed floodplains along portions of the reach. Transient sediment covers 10-40% of the stream bottom.	Often incised, but less than Severe or Poor. Banks more stable than Severe or Poor due to lower bank slopes. Erosion may be present on 40-60% of both banks. Vegetative protection on 40-60% of banks. Streambanks may be vertical or undercut. AND/OR 40-60% of stream is covered by sediment. Sediment may be temporary/transient, contribute to instability. Deposition that contribute to stability, may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and depositional features which contribute to stability.	Overwidened/incised. Vertically/laterally unstable. Likely to widen further. Majority of both banks are near vertical. Erosion present on 60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in nature, and contributing to instability. AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sediment deposition is absent.	Deeply incised (or excavated), vertical/lateral instability. Severe incision, flow contained within the banks. Streambed below average rooting depth, majority of banks vertical/undercut. Vegetative protection present on less than 20% of banks, is not preventing erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel. Greater than 80% of stream bed is covered by deposition, contributing to instability. Multiple thread channels and/or subterranean flow.
Score	3	2.4	2	1.6	1

NOTES>>	no slumping on banks; banks mostly stable; little erosion; adjacent to on-ramp roadway
---------	--

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

Conditional Category								NOTES>>
Riparian Buffers	Optimal	Suboptimal		Marginal		Poor		
	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and a non-maintained understory. Wetlands located within the riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	
			High	Low	High	Low	High	
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5	
1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors. 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below. 3. Enter the % Riparian Area and Score for each riparian category in the blocks below.						Ensure the sums of % Riparian Blocks equal 100		
Right Bank	% Riparian Area>	20%	80%				100%	
	Score >	1.5	0.5					
Left Bank	% Riparian Area>	15%	85%				100%	
	Score >	1.5	0.6					
CI= (Sum % RA * Scores*0.01)/2								
						Rt Bank CI >	0.70	
						Lt Bank CI >	0.74	

3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddedness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features.

Instream Habitat/ Available Cover	Conditional Category				NOTES>>shady; varied water velocities; some riffle/pool sequences; some leaf pack; no undercut banks; few headcuts
	Optimal	Suboptimal	Marginal	Poor	
	Habitat elements are typically present in greater than 50% of the reach.	Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of populations.	Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of populations.	Habitat elements listed above are lacking or are unstable. Habitat elements are typically present in less than 10% of the reach.	
Score	1.5	1.2	0.9	0.5	

CI

2.4

CI

1.20

Stream Impact Assessment Form Page 2

Project #	Applicant	Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	
45612-001	VDOT	Chesapeake	R4	0208020802	2/5/2014	2	315	N/A	
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock								NOTES>>adjacent to on-ramp roadway and cemetery property; natural stream features observed	
Channel Alteration	Conditional Category								
	Negligible	Minor	Moderate		Severe				
	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks shored with gabion, riprap, or cement.			
	SCORE	1.5	1.3	1.1	0.9	0.7	0.5		
REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH								1.10	
<small>NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.</small>								THE REACH CONDITION INDEX (RCI) >>	1.08
								<small>RCI= (Sum of all CI's)/5</small>	
								COMPENSATION REQUIREMENT (CR) >>	N/A
								<small>CR = RCI X LF X IF</small>	

INSERT PHOTOS:

Photo of SAR 2 looking downstream.



DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1)

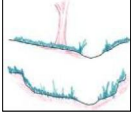
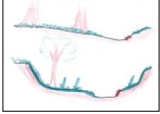
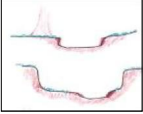
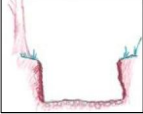

Unified Stream Methodology for use in Virginia

For use in Wadeable channels classified as intermittent or perennial

Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR #	Impact/SAR length	Impact Factor
45612-001	I-64 / High Rise Bridge Corridor Study	Chesapeake	R3	0208020802	2/5/2014	3	382	N/A

Name(s) of Evaluator(s)	Stream Name and Information
Glenn Wilson & Dave Kwasniewski	Tributary of Newton Creek

1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation)

Channel Condition	Conditional Category				
	Optimal	Suboptimal	Marginal	Poor	Severe
					
	Very little incision or active erosion; 80-100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient sediment deposition covers less than 10% of bottom.	Slightly incised, few areas of active erosion or unprotected banks. Majority of banks are stable (60-80%). Vegetative protection or natural rock prominent (60-80%) AND/OR Depositional features contribute to stability. The bankfull and low flow channels are well defined. Stream likely has access to bankfull benches, or newly developed floodplains along portions of the reach. Transient sediment covers 10-40% of the stream bottom.	Often incised, but less than Severe or Poor. Banks more stable than Severe or Poor due to lower bank slopes. Erosion may be present on 40-60% of both banks. Vegetative protection on 40-60% of banks. Streambanks may be vertical or undercut. AND/OR 40-60% of stream is covered by sediment. Sediment may be temporary/transient, contribute to instability. Deposition that contribute to stability, may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and depositional features which contribute to stability.	Overwidened/incised. Vertically/laterally unstable. Likely to widen further. Majority of both banks are near vertical. Erosion present on 60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in nature, and contributing to instability. AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sediment deposition is absent.	Deeply incised (or excavated), vertical/lateral instability. Severe incision, flow contained within the banks. Streambed below average rooting depth, majority of banks vertical/undercut. Vegetative protection present on less than 20% of banks, is not preventing erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel. Greater than 80% of stream bed is covered by deposition, contributing to instability. Multiple thread channels and/or subterranean flow.
Score	3	2.4	2	1.6	1

NOTES>>	same stream flow throughout reach; minimum bank erosion; located at toe of slope; some mature trees on left bank; no undercut banks
---------	---

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

Conditional Category								NOTES>>
Riparian Buffers	Optimal	Suboptimal		Marginal		Poor		
	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and a non-maintained understory. Wetlands located within the riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	
			High	Low	High	Low	High	
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5	
1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors. 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below. 3. Enter the % Riparian Area and Score for each riparian category in the blocks below.						Ensure the sums of % Riparian Blocks equal 100		
Right Bank	% Riparian Area>	12%	88%				100%	
	Score >	0.75	0.5					
Left Bank	% Riparian Area>	100%					100%	
	Score >	1.5						
	CI= (Sum % RA * Scores*0.01)/2							
Rt Bank CI >							0.53	
Lt Bank CI >							1.50	

3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddedness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features.

Instream Habitat/Available Cover	Conditional Category				NOTES>>much shade; much leaf mat/pack; little riffle/pool sequence
	Optimal	Suboptimal	Marginal	Poor	
	Habitat elements are typically present in greater than 50% of the reach.	Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of populations.	Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of populations.	Habitat elements listed above are lacking or are unstable. Habitat elements are typically present in less than 10% of the reach.	
Score	1.5	1.2	0.9	0.5	

CI 1.20

Stream Impact Assessment Form Page 2

Project #	Applicant	Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	
45612-001	VDOT	Chesapeake	R3	0208020802	2/5/2014	3	382	N/A	
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock							NOTES>>stream reach located at toe of slope along on-ramp roadway		
Channel Alteration	Conditional Category								
	Negligible	Minor	Moderate		Severe				
	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks shored with gabion, riprap, or cement.			
	SCORE	1.5	1.3	1.1	0.9	0.7			0.5
REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH							0.70		
NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.							THE REACH CONDITION INDEX (RCI) >>		0.98
							RCI= (Sum of all CI's)/5		
							COMPENSATION REQUIREMENT (CR) >>		N/A
							CR = RCI X LF X IF		

INSERT PHOTOS:

Photo of SAR 3 looking downstream.



DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1)

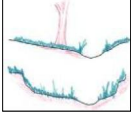
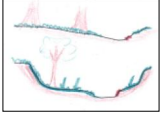
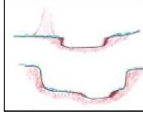
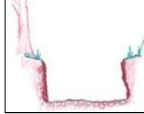

Unified Stream Methodology for use in Virginia

For use in Wadeable channels classified as intermittent or perennial

Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR #	Impact/SAR length	Impact Factor
45612-001	I-64 / High Rise Bridge Corridor Study	Chesapeake	R3	0208020802	2/5/2014	4	575	N/A

Name(s) of Evaluator(s)	Stream Name and Information
Glenn Wilson & Dave Kwasniewski	Tributary of Newton Creek

1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation)

Channel Condition	Conditional Category				
	Optimal	Suboptimal	Marginal	Poor	Severe
					
	Very little incision or active erosion; 80-100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient sediment deposition covers less than 10% of bottom.	Slightly incised, few areas of active erosion or unprotected banks. Majority of banks are stable (60-80%). Vegetative protection or natural rock prominent (60-80%) AND/OR Depositional features contribute to stability. The bankfull and low flow channels are well defined. Stream likely has access to bankfull benches, or newly developed floodplains along portions of the reach. Transient sediment covers 10-40% of the stream bottom.	Often incised, but less than Severe or Poor. Banks more stable than Severe or Poor due to lower bank slopes. Erosion may be present on 40-60% of both banks. Vegetative protection on 40-60% of banks. Streambanks may be vertical or undercut. AND/OR 40-60% of stream is covered by sediment. Sediment may be temporary/transient, contribute to stability. Deposition that contribute to stability, may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and depositional features which contribute to stability.	Overwidened/incised. Vertically/laterally unstable. Likely to widen further. Majority of both banks are near vertical. Erosion present on 60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in nature, and contributing to instability. AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sediment deposition is absent.	Deeply incised (or excavated), vertical/lateral instability. Severe incision, flow contained within the banks. Streambed below average rooting depth, majority of banks vertical/undercut. Vegetative protection present on less than 20% of banks, is not preventing erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel. Greater than 80% of stream bed is covered by deposition, contributing to instability. Multiple thread channels and/or subterranean flow.
Score	3	2.4	2	1.6	1

NOTES>>	surrounded by roadways; some bank erosion
---------	---

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

Conditional Category								NOTES>>
Riparian Buffers	Optimal	Suboptimal		Marginal		Poor		
	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and a non-maintained understory. Wetlands located within the riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	
			High	Low	High	Low	High	
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5	

1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors.	Ensure the sums of % Riparian Blocks equal 100	
2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.		
3. Enter the % Riparian Area and Score for each riparian category in the blocks below.		

Right Bank	% Riparian Area>	15%	85%					100%
	Score >	1.5	0.6					
Left Bank	% Riparian Area>	30%	70%					100%
	Score >	1.5	0.5					

CI= (Sum % RA * Scores*0.01)/2

Rt Bank CI > 0.74

Lt Bank CI > 0.80

3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddedness; shade; undercut banks; root mats; SAV; riffle pools complexes, stable features.

Instream Habitat/ Available Cover	Conditional Category				NOTES>>large trees line banks providing some shade; leaf packs observed; few root mats; sandy banks/substrate
	Optimal	Suboptimal	Marginal	Poor	
	Habitat elements are typically present in greater than 50% of the reach.	Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of populations.	Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of populations.	Habitat elements listed above are lacking or are unstable. Habitat elements are typically present in less than 10% of the reach.	
Score	1.5	1.2	0.9	0.5	

CI

0.90

Stream Impact Assessment Form Page 2

Project #	Applicant	Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
45612-001	VDOT	Chesapeake	R3	0208020802	2/5/2014	4	575	N/A

4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock

Channel Alteration	Conditional Category					SCORE
	Negligible	Minor	Moderate		Severe	
	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks shored with gabion, riprap, or cement.
	1.5	1.3	1.1	0.9	0.7	0.5

NOTES>>box culverts up- and down-stream; straight, very little sinuosity

0.90

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

0.91

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

INSERT PHOTOS:

Photo of SAR 4 looking upstream.



DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1)

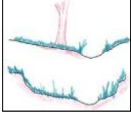
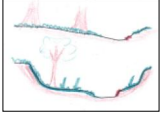
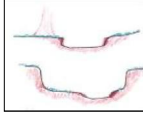
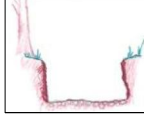

Unified Stream Methodology for use in Virginia

For use in Wadeable channels classified as intermittent or perennial

Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR #	Impact/SAR length	Impact Factor
45612-001	I-64 / High Rise Bridge Corridor Study	Chesapeake	R3	0208020802	2/5/2014	5	1309	N/A

Name(s) of Evaluator(s)	Stream Name and Information
Glenn Wilson & Dave Kwasniewski	Tributary of Newton Creek

1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation)

Channel Condition	Conditional Category				
	Optimal	Suboptimal	Marginal	Poor	Severe
					
	Very little incision or active erosion; 80-100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient sediment deposition covers less than 10% of bottom.	Slightly incised, few areas of active erosion or unprotected banks. Majority of banks are stable (60-80%). Vegetative protection or natural rock prominent (60-80%) AND/OR Depositional features contribute to stability. The bankfull and low flow channels are well defined. Stream likely has access to bankfull benches, or newly developed floodplains along portions of the reach. Transient sediment covers 10-40% of the stream bottom.	Often incised, but less than Severe or Poor. Banks more stable than Severe or Poor due to lower bank slopes. Erosion may be present on 40-60% of both banks. Vegetative protection on 40-60% of banks. Streambanks may be vertical or undercut. AND/OR 40-60% of stream is covered by sediment. Sediment may be temporary/transient, contribute to stability. Deposition that contribute to stability, may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and depositional features which contribute to stability.	Overwidened/incised. Vertically/laterally unstable. Likely to widen further. Majority of both banks are near vertical. Erosion present on 60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in nature, and contributing to instability. AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sediment deposition is absent.	Deeply incised (or excavated), vertical/lateral instability. Severe incision, flow contained within the banks. Streambed below average rooting depth, majority of banks vertical/undercut. Vegetative protection present on less than 20% of banks, is not preventing erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel. Greater than 80% of stream bed is covered by deposition, contributing to instability. Multiple thread channels and/or subterranean flow.
Score	3	2.4	2	1.6	1

NOTES>>	Some bank erosion; trees line both banks; floodplain access
---------	---

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

Conditional Category								NOTES>>
Riparian Buffers	Optimal	Suboptimal		Marginal		Poor		
	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and a non-maintained understory. Wetlands located within the riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	
			High	Low	High	Low	High	
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5	

1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors.	Ensure the sums of % Riparian Blocks equal 100
2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.	
3. Enter the % Riparian Area and Score for each riparian category in the blocks below.	

Right Bank	% Riparian Area>	100%					100%
	Score >	1.5					
Left Bank	% Riparian Area>	100%					100%
	Score >	1.5					

$$CI = (\text{Sum } \% RA * \text{Scores} * 0.01) / 2$$

$$Rt \text{ Bank } CI > 1.50$$

$$Lt \text{ Bank } CI > 1.50$$

3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddedness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features.

Instream Habitat/ Available Cover	Conditional Category				NOTES>>root mats present; logs observed in stream; leaf packs observed; shade provided by trees that line both banks; minimal riffle/pool sequence
	Optimal	Suboptimal	Marginal	Poor	
	Habitat elements are typically present in greater than 50% of the reach.	Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of populations.	Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of populations.	Habitat elements listed above are lacking or are unstable. Habitat elements are typically present in less than 10% of the reach.	
Score	1.5	1.2	0.9	0.5	

CI

1.20

Stream Impact Assessment Form Page 2

Project #	Applicant	Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	
45612-001	VDOT	Chesapeake	R3	0208020802	2/5/2014	5	1309	N/A	
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock							NOTES>>box culverts up- and downstream		
Channel Alteration	Conditional Category								
	Negligible	Minor	Moderate		Severe				
	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks shored with gabion, riprap, or cement.			
	SCORE	1.5	1.3	1.1	0.9	0.7			0.5
REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH							1.30		
NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.							THE REACH CONDITION INDEX (RCI) >>		1.20
							RCI= (Sum of all CI's)/5		
							COMPENSATION REQUIREMENT (CR) >>		N/A
							CR = RCI X LF X IF		

INSERT PHOTOS:

Photo of SAR 5 looking downstream.



DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1)

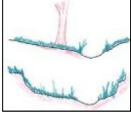
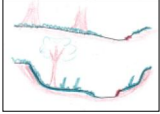
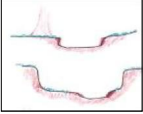
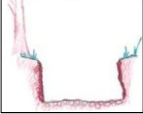

Unified Stream Methodology for use in Virginia

For use in Wadeable channels classified as intermittent or perennial

Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR #	Impact/SAR length	Impact Factor
45612-001	I-64 / High Rise Bridge Corridor Study	Chesapeake	R3	0208020802	2/5/2014	6	210	N/A

Name(s) of Evaluator(s)	Stream Name and Information
Glenn Wilson & Dave Kwasniewski	Tributary of Newton Creek

1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation)

Channel Condition	Conditional Category				
	Optimal	Suboptimal	Marginal	Poor	Severe
					
	Very little incision or active erosion; 80-100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient sediment deposition covers less than 10% of bottom.	Slightly incised, few areas of active erosion or unprotected banks. Majority of banks are stable (60-80%). Vegetative protection or natural rock prominent (60-80%) AND/OR Depositional features contribute to stability. The bankfull and low flow channels are well defined. Stream likely has access to bankfull benches, or newly developed floodplains along portions of the reach. Transient sediment covers 10-40% of the stream bottom.	Often incised, but less than Severe or Poor. Banks more stable than Severe or Poor due to lower bank slopes. Erosion may be present on 40-60% of both banks. Vegetative protection on 40-60% of banks. Streambanks may be vertical or undercut. AND/OR 40-60% of stream is covered by sediment. Sediment may be temporary/transient, contribute to stability. Deposition that contributes to stability, may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and depositional features which contribute to stability.	Overwidened/incised. Vertically/laterally unstable. Likely to widen further. Majority of both banks are near vertical. Erosion present on 60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in nature, and contributing to instability. AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sediment deposition is absent.	Deeply incised (or excavated), vertical/lateral instability. Severe incision, flow contained within the banks. Streambed below average rooting depth, majority of banks vertical/undercut. Vegetative protection present on less than 20% of banks, is not preventing erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel. Greater than 80% of stream bed is covered by deposition, contributing to instability. Multiple thread channels and/or subterranean flow.
Score	3	2.4	2	1.6	1

NOTES>>	Fairly stable banks with some bank erosion downstream from two outfall pipes from nearby parking area that form a scour pool.
---------	---

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

Conditional Category								NOTES>>
Riparian Buffers	Optimal	Suboptimal		Marginal		Poor		
	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and a non-maintained understory. Wetlands located within the riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	
			High	Low	High	Low	High	
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5	
<div>1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors.</div> <div>2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.</div> <div>3. Enter the % Riparian Area and Score for each riparian category in the blocks below.</div>								
Right Bank	% Riparian Area>	100%					100%	
	Score >	1.5						
Left Bank	% Riparian Area>	100%					100%	
	Score >	1.5						
CI= (Sum % RA * Scores*0.01)/2								
Rt Bank CI > 1.50								
Lt Bank CI > 1.50								

3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddedness; shade; undercut banks; root mats; SAV; riffle pools complexes, stable features.

Instream Habitat/ Available Cover	Conditional Category				NOTES>>mature trees provide shade and root mats; no undercuts; some trees have fallen into the stream; large scour pool present
	Optimal	Suboptimal	Marginal	Poor	
	Habitat elements are typically present in greater than 50% of the reach.	Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of populations.	Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of populations.	Habitat elements listed above are lacking or are unstable. Habitat elements are typically present in less than 10% of the reach.	
Score	1.5	1.2	0.9	0.5	

CI

2.0

CI

1.20

Stream Impact Assessment Form Page 2

Project #	Applicant	Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
45612-001	VDOT	Chesapeake	R3	0208020802	2/5/2014	6	210	N/A

4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock

Channel Alteration	Conditional Category					NOTES>>concrete embankment leading to BMP upstream, double box culvert downstream; riprap along upper portion of reach; effluent from two outfall pipes from nearby parking lot created large scour pool	
	Negligible	Minor	Moderate	Severe			
	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.		Greater than 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks shored with gabion, riprap, or cement.
SCORE	1.5	1.3	1.1	0.9	0.7	0.5	0.90

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>	1.12
<small>RCI= (Sum of all CI's)/5</small>	
COMPENSATION REQUIREMENT (CR) >>	N/A
<small>CR = RCI X LF X IF</small>	

INSERT PHOTOS:

Photo of SAR 6 looking upstream.



DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1)

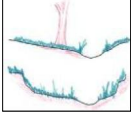
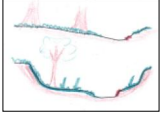
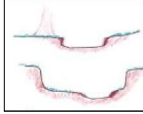
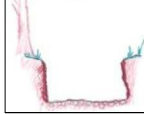

Unified Stream Methodology for use in Virginia

For use in Wadeable channels classified as intermittent or perennial

Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR #	Impact/SAR length	Impact Factor
45612-001	I-64 / High Rise Bridge Corridor Study	Chesapeake	R3	0208020802	2/5/2014	7	524	N/A

Name(s) of Evaluator(s)	Stream Name and Information
Glenn Wilson & Dave Kwasniewski	Tributary of Newton Creek

1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation)

Channel Condition	Conditional Category				
	Optimal	Suboptimal	Marginal	Poor	Severe
					
	Very little incision or active erosion; 80-100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient sediment deposition covers less than 10% of bottom.	Slightly incised, few areas of active erosion or unprotected banks. Majority of banks are stable (60-80%). Vegetative protection or natural rock prominent (60-80%) AND/OR Depositional features contribute to stability. The bankfull and low flow channels are well defined. Stream likely has access to bankfull benches, or newly developed floodplains along portions of the reach. Transient sediment covers 10-40% of the stream bottom.	Often incised, but less than Severe or Poor. Banks more stable than Severe or Poor due to lower bank slopes. Erosion may be present on 40-60% of both banks. Vegetative protection on 40-60% of banks. Streambanks may be vertical or undercut. AND/OR 40-60% of stream is covered by sediment. Sediment may be temporary/transient, contribute to stability. Deposition that contributes to stability, may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and depositional features which contribute to stability.	Overwidened/incised. Vertically/laterally unstable. Likely to widen further. Majority of both banks are near vertical. Erosion present on 60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in nature, and contributing to instability. AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sediment deposition is absent.	Deeply incised (or excavated), vertical/lateral instability. Severe incision, flow contained within the banks. Streambed below average rooting depth, majority of banks vertical/undercut. Vegetative protection present on less than 20% of banks, is not preventing erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel. Greater than 80% of stream bed is covered by deposition, contributing to instability. Multiple thread channels and/or subterranean flow.
Score	3	2.4	2	1.6	1

NOTES>>	Vegetation on top of banks; both banks lined with trees; little undercutting observed
---------	---

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

Conditional Category								NOTES>>
Riparian Buffers	Optimal	Suboptimal		Marginal		Poor		
	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and a non-maintained understory. Wetlands located within the riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	
			High	Low	High	Low	High	
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5	
1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors. 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below. 3. Enter the % Riparian Area and Score for each riparian category in the blocks below.						Ensure the sums of % Riparian Blocks equal 100		
Right Bank	% Riparian Area>	75%	25%				100%	
	Score >	1.5	0.5					
Left Bank	% Riparian Area>	30%	70%				100%	
	Score >	1.5	0.5					
CI= (Sum % RA * Scores*0.01)/2								
Rt Bank CI > 1.25								
Lt Bank CI > 0.80								

3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddedness; shade; undercut banks; root mats; SAV; riffle pools complexes, stable features.

Instream Habitat/ Available Cover	Conditional Category				NOTES>>minimal leaf pack observed; shade from trees along both banks; no root mats observed
	Optimal	Suboptimal	Marginal	Poor	
	Habitat elements are typically present in greater than 50% of the reach.	Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of populations.	Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of populations.	Habitat elements listed above are lacking or are unstable. Habitat elements are typically present in less than 10% of the reach.	
Score	1.5	1.2	0.9	0.5	

CI

CI

0.50

Stream Impact Assessment Form Page 2

Project #	Applicant	Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
45612-001	VDOT	Chesapeake	R3	0208020802	2/5/2014	7	524	N/A
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock								NOTES>>straight channel parallel to roadway
Channel Alteration	Conditional Category							
	Negligible	Minor	Moderate		Severe			
	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks shored with gabion, riprap, or cement.		
	SCORE	1.5	1.3	1.1	0.9	0.7	0.5	
REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH								0.50
NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.								
THE REACH CONDITION INDEX (RCI) >>								0.81
RCI= (Sum of all CI's)/5								
COMPENSATION REQUIREMENT (CR) >>								N/A
CR = RCI X LF X IF								

INSERT PHOTOS:

Photo of SAR 7 looking upstream.



DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1)

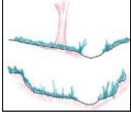
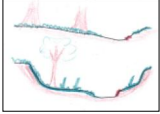
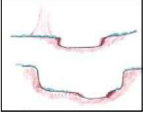
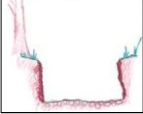

Unified Stream Methodology for use in Virginia

For use in Wadeable channels classified as intermittent or perennial

Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR #	Impact/SAR length	Impact Factor
45612-001	I-64 / High Rise Bridge Corridor Study	Chesapeake	R3	0208020802	2/6/2014	8	630	N/A

Name(s) of Evaluator(s)	Stream Name and Information
Glenn Wilson & Dave Kwasniewski	Tributary of Goose Creek

1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation)

Channel Condition	Conditional Category				
	Optimal	Suboptimal	Marginal	Poor	Severe
					
	Very little incision or active erosion; 80-100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient sediment deposition covers less than 10% of bottom.	Slightly incised, few areas of active erosion or unprotected banks. Majority of banks are stable (60-80%). Vegetative protection or natural rock prominent (60-80%) AND/OR Depositional features contribute to stability. The bankfull and low flow channels are well defined. Stream likely has access to bankfull benches, or newly developed floodplains along portions of the reach. Transient sediment covers 10-40% of the stream bottom.	Often incised, but less than Severe or Poor. Banks more stable than Severe or Poor due to lower bank slopes. Erosion may be present on 40-60% of both banks. Vegetative protection on 40-60% of banks. Streambanks may be vertical or undercut. AND/OR 40-60% of stream is covered by sediment. Sediment may be temporary/transient, contribute to stability. Deposition that contribute to stability, may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and depositional features which contribute to stability.	Overwidened/incised. Vertically/laterally unstable. Likely to widen further. Majority of both banks are near vertical. Erosion present on 60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in nature, and contributing to instability. AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sediment deposition is absent.	Deeply incised (or excavated), vertical/lateral instability. Severe incision, flow contained within the banks. Streambed below average rooting depth, majority of banks vertical/undercut. Vegetative protection present on less than 20% of banks, is not preventing erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel. Greater than 80% of stream bed is covered by deposition, contributing to instability. Multiple thread channels and/or subterranean flow.
Score	3	2.4	2	1.6	1

NOTES>>	Stable banks; little erosion; no mid-point bars; stream reach can access floodplain
---------	---

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

Conditional Category								NOTES>>
Riparian Buffers	Optimal	Suboptimal		Marginal		Poor		
	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and a non-maintained understory. Wetlands located within the riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	
			High	Low	High	Low	High	
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5	

1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors.	Ensure the sums of % Riparian Blocks equal 100
2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.	
3. Enter the % Riparian Area and Score for each riparian category in the blocks below.	

Right Bank	% Riparian Area>	100%						100%
	Score >	1.5						
Left Bank	% Riparian Area>	100%						100%
	Score >	1.5						

CI= (Sum % RA * Scores*0.01)/2

Rt Bank CI > 1.50

Lt Bank CI > 1.50

3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddedness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features.

Instream Habitat/ Available Cover	Conditional Category				NOTES>>riffle/pool sequence observed; shade provided by trees along both banks; root mats observed; leaf packs observed; undercut banks observed
	Optimal	Suboptimal	Marginal	Poor	
	Habitat elements are typically present in greater than 50% of the reach.	Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of populations.	Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of populations.	Habitat elements listed above are lacking or are unstable. Habitat elements are typically present in less than 10% of the reach.	
Score	1.5	1.2	0.9	0.5	

CI

1.50

Stream Impact Assessment Form Page 2

Project #	Applicant	Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
45612-001	VDOT	Chesapeake	R3	0208020802	2/5/2014	8	630	N/A

4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock

NOTES>>box culvert upstream

Channel Alteration	Conditional Category				
	Negligible	Minor	Moderate	Severe	
	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.
SCORE	1.5	1.3	1.1	0.9	0.7

1.30

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

1.46

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

INSERT PHOTOS:

Photo of SAR 8 looking downstream.



DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1)

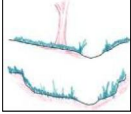
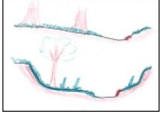
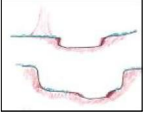
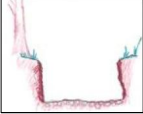

Unified Stream Methodology for use in Virginia

For use in Wadeable channels classified as intermittent or perennial

Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR #	Impact/SAR length	Impact Factor
45612-001	I-64 / High Rise Bridge Corridor Study	Chesapeake	R3	0208020802	2/6/2014	9	2335	N/A

Name(s) of Evaluator(s)	Stream Name and Information
Glenn Wilson & Dave Kwasniewski	Tributary of Goose Creek

1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation)

Channel Condition	Conditional Category				
	Optimal	Suboptimal	Marginal	Poor	Severe
					
	Very little incision or active erosion; 80-100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient sediment deposition covers less than 10% of bottom.	Slightly incised, few areas of active erosion or unprotected banks. Majority of banks are stable (60-80%). Vegetative protection or natural rock prominent (60-80%) AND/OR Depositional features contribute to stability. The bankfull and low flow channels are well defined. Stream likely has access to bankfull benches, or newly developed floodplains along portions of the reach. Transient sediment covers 10-40% of the stream bottom.	Often incised, but less than Severe or Poor. Banks more stable than Severe or Poor due to lower bank slopes. Erosion may be present on 40-60% of both banks. Vegetative protection on 40-60% of banks. Streambanks may be vertical or undercut. AND/OR 40-60% of stream is covered by sediment. Sediment may be temporary/transient, contribute to stability. Deposition that contribute to stability, may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and depositional features which contribute to stability.	Overwidened/incised. Vertically/laterally unstable. Likely to widen further. Majority of both banks are near vertical. Erosion present on 60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in nature, and contributing to instability. AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sediment deposition is absent.	Deeply incised (or excavated), vertical/lateral instability. Severe incision, flow contained within the banks. Streambed below average rooting depth, majority of banks vertical/undercut. Vegetative protection present on less than 20% of banks, is not preventing erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel. Greater than 80% of stream bed is covered by deposition, contributing to instability. Multiple thread channels and/or subterranean flow.
Score	3	2.4	2	1.6	1

CI

2.0

NOTES>>	Braided channels; forested; available floodplain; low banks
---------	---

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

Conditional Category								NOTES>>
Riparian Buffers	Optimal	Suboptimal		Marginal		Poor		
	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and a non-maintained understory. Wetlands located within the riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	
			High	Low	High	Low	High	
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5	

1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors.
2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.
3. Enter the % Riparian Area and Score for each riparian category in the blocks below.

Right Bank	% Riparian Area>	75%	25%					100%
	Score >	1.5	0.5					
Left Bank	% Riparian Area>	100%						100%
	Score >	1.5						

CI= (Sum % RA * Scores*0.01)/2

Rt Bank CI > 1.25

Lt Bank CI > 1.50

CI

1.38

3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddedness; shade; undercut banks; root mats; SAV; riffle pools complexes, stable features.

Instream Habitat/ Available Cover	Conditional Category				NOTES>>root mats with woody and leafy debris observed; shade from tree-lined banks; undercut banks; varying stream velocity
	Optimal	Suboptimal	Marginal	Poor	
	Habitat elements are typically present in greater than 50% of the reach.	Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of populations.	Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of populations.	Habitat elements listed above are lacking or are unstable. Habitat elements are typically present in less than 10% of the reach.	
Score	1.5	1.2	0.9	0.5	

CI

1.20

Stream Impact Assessment Form Page 2

Project #	Applicant	Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
45612-001	VDOT	Chesapeake	R3	0208020802	2/5/2014	9	2335	N/A
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock								NOTES>>culvert upstream under roadway
Channel Alteration	Conditional Category							
	Negligible	Minor	Moderate		Severe			
	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks shored with gabion, riprap, or cement.		
	SCORE	1.5	1.3	1.1	0.9	0.7	0.5	
REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH								1.30
NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.								
THE REACH CONDITION INDEX (RCI) >>								1.18
RCI= (Sum of all CI's)/5								
COMPENSATION REQUIREMENT (CR) >>								N/A
CR = RCI X LF X IF								

INSERT PHOTOS:

Photo of SAR 9 looking downstream.



DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1)

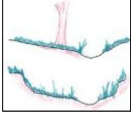
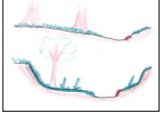
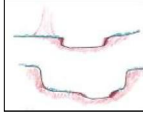
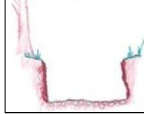

Unified Stream Methodology for use in Virginia

For use in Wadeable channels classified as intermittent or perennial

Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR #	Impact/SAR length	Impact Factor
45612-001	I-64 / High Rise Bridge Corridor Study	Chesapeake	R3	0208020802	2/6/2014	10	870	N/A

Name(s) of Evaluator(s)	Stream Name and Information
Glenn Wilson & Dave Kwasniewski	Tributary of Goose Creek

1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation)

Channel Condition	Conditional Category				
	Optimal	Suboptimal	Marginal	Poor	Severe
					
	Very little incision or active erosion; 80-100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient sediment deposition covers less than 10% of bottom.	Slightly incised, few areas of active erosion or unprotected banks. Majority of banks are stable (60-80%). Vegetative protection or natural rock prominent (60-80%) AND/OR Depositional features contribute to stability. The bankfull and low flow channels are well defined. Stream likely has access to bankfull benches, or newly developed floodplains along portions of the reach. Transient sediment covers 10-40% of the stream bottom.	Often incised, but less than Severe or Poor. Banks more stable than Severe or Poor due to lower bank slopes. Erosion may be present on 40-60% of both banks. Vegetative protection on 40-60% of banks. Streambanks may be vertical or undercut. AND/OR 40-60% of stream is covered by sediment. Sediment may be temporary/transient, contribute to stability. Deposition that contributes to stability, may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and depositional features which contribute to stability.	Overwidened/incised. Vertically/laterally unstable. Likely to widen further. Majority of both banks are near vertical. Erosion present on 60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in nature, and contributing to instability. AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sediment deposition is absent.	Deeply incised (or excavated), vertical/lateral instability. Severe incision, flow contained within the banks. Streambed below average rooting depth, majority of banks vertical/undercut. Vegetative protection present on less than 20% of banks, is not preventing erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel. Greater than 80% of stream bed is covered by deposition, contributing to instability. Multiple thread channels and/or subterranean flow.
Score	3	2.4	2	1.6	1

CI

2.0

NOTES>>	Forested; available floodplain; low banks; 50% sediment cover near confluence to approximately 200' upstream
---------	--

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

Conditional Category								NOTES>>
Riparian Buffers	Optimal	Suboptimal		Marginal		Poor		
	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and a non-maintained understory. Wetlands located within the riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	
			High	Low	High	Low	High	
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5	

1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors.
2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.
3. Enter the % Riparian Area and Score for each riparian category in the blocks below.

Right Bank	% Riparian Area>	100%					100%
	Score >	1.5					
Left Bank	% Riparian Area>	90%	10%				100%
	Score >	1.5	0.6				

CI= (Sum % RA * Scores*0.01)/2

Rt Bank CI > 1.50

Lt Bank CI > 1.41

CI

1.46

3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddedness; shade; undercut banks; root mats; SAV; riffle pools complexes, stable features.

Instream Habitat/ Available Cover	Conditional Category				NOTES>>few root mats observed; shade from tree-lined banks; riffle / pool sequence observed; some substrate sorting
	Optimal	Suboptimal	Marginal	Poor	
	Habitat elements are typically present in greater than 50% of the reach.	Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of populations.	Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of populations.	Habitat elements listed above are lacking or are unstable. Habitat elements are typically present in less than 10% of the reach.	
Score	1.5	1.2	0.9	0.5	

CI

1.20

Stream Impact Assessment Form Page 2

Project #	Applicant	Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
45612-001	VDOT	Chesapeake	R3	0208020802	2/5/2014	10	870	N/A

4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock

NOTES>>culvert upstream under roadway

Channel Alteration	Conditional Category					
	Negligible	Minor		Moderate		Severe
	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks shored with gabion, riprap, or cement.
SCORE	1.5	1.3	1.1	0.9	0.7	0.5

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

1.19

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

INSERT PHOTOS:

Photo of SAR 10 looking downstream.



DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1)

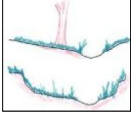
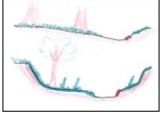
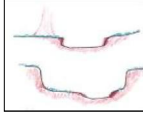
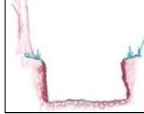

Unified Stream Methodology for use in Virginia

For use in Wadeable channels classified as intermittent or perennial

Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR #	Impact/SAR length	Impact Factor
45612-001	I-64 / High Rise Bridge Corridor Study	Chesapeake	R3	0208020802	2/6/2014	11	800	N/A

Name(s) of Evaluator(s)	Stream Name and Information
Glenn Wilson & Dave Kwasniewski	Tributary of Goose Creek

1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation)

Channel Condition	Conditional Category				
	Optimal	Suboptimal	Marginal	Poor	Severe
					
	Very little incision or active erosion; 80-100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient sediment deposition covers less than 10% of bottom.	Slightly incised, few areas of active erosion or unprotected banks. Majority of banks are stable (60-80%). Vegetative protection or natural rock prominent (60-80%) AND/OR Depositional features contribute to stability. The bankfull and low flow channels are well defined. Stream likely has access to bankfull benches, or newly developed floodplains along portions of the reach. Transient sediment covers 10-40% of the stream bottom.	Often incised, but less than Severe or Poor. Banks more stable than Severe or Poor due to lower bank slopes. Erosion may be present on 40-60% of both banks. Vegetative protection on 40-60% of banks. Streambanks may be vertical or undercut. AND/OR 40-60% of stream is covered by sediment. Sediment may be temporary/transient, contribute to stability. Deposition that contributes to stability, may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and depositional features which contribute to stability.	Overwidened/incised. Vertically/laterally unstable. Likely to widen further. Majority of both banks are near vertical. Erosion present on 60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in nature, and contributing to instability. AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sediment deposition is absent.	Deeply incised (or excavated), vertical/lateral instability. Severe incision, flow contained within the banks. Streambed below average rooting depth, majority of banks vertical/undercut. Vegetative protection present on less than 20% of banks, is not preventing erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel. Greater than 80% of stream bed is covered by deposition, contributing to instability. Multiple thread channels and/or subterranean flow.
Score	3	2.4	2	1.6	1

CI

2.0

NOTES>>	Forested area between two roadways; available floodplain; low banks less than 1' high; high leaf pack observed
---------	--

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

Conditional Category								NOTES>>
Riparian Buffers	Optimal	Suboptimal		Marginal		Poor		
	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and a non-maintained understory. Wetlands located within the riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	
			High	Low	High	Low	High	
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5	
<div>1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors. 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below. 3. Enter the % Riparian Area and Score for each riparian category in the blocks below.</div> <div>Ensure the sums of % Riparian Blocks equal 100</div>								
Right Bank	% Riparian Area>	100%					100%	
	Score >	1.5						
Left Bank	% Riparian Area>	50%	50%				100%	
	Score >	1.5	0.6					
CI= (Sum % RA * Scores*0.01)/2								
Rt Bank CI > 1.50 Lt Bank CI > 1.05								

3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddedness; shade; undercut banks; root mats; SAV; riffle pool complexes, stable features.

Instream Habitat/ Available Cover	Conditional Category				NOTES>>some root mats and much woody and leafy debris observed; shade from forested area; riffle / pool sequence observed; access to floodplain
	Optimal	Suboptimal	Marginal	Poor	
	Habitat elements are typically present in greater than 50% of the reach.	Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of populations.	Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of populations.	Habitat elements listed above are lacking or are unstable. Habitat elements are typically present in less than 10% of the reach.	
Score	1.5	1.2	0.9	0.5	CI 1.20

Stream Impact Assessment Form Page 2

Project #	Applicant	Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
45612-001	VDOT	Chesapeake	R3	0208020802	2/5/2014	11	800	N/A

4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock

NOTES>>culverts upstream and downstream under roadways

Channel Alteration	Conditional Category				
	Negligible	Minor	Moderate	Severe	
	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.
SCORE	1.5	1.3	1.1	0.9	0.7

Greater than 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks shored with gabion, riprap, or cement.

1.10

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

1.12

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

INSERT PHOTOS:

Photo of SAR 11 looking upstream.



DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1)

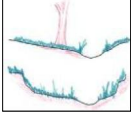
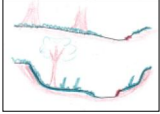
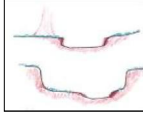
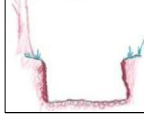

Unified Stream Methodology for use in Virginia

For use in Wadeable channels classified as intermittent or perennial

Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR #	Impact/SAR length	Impact Factor
45612-001	I-64 / High Rise Bridge Corridor Study	Chesapeake	R3	0208020802	2/6/2014	12	345	N/A

Name(s) of Evaluator(s)	Stream Name and Information
Glenn Wilson & Dave Kwasniewski	Tributary of Goose Creek

1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation)

Channel Condition	Conditional Category				
	Optimal	Suboptimal	Marginal	Poor	Severe
					
	Very little incision or active erosion; 80-100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient sediment deposition covers less than 10% of bottom.	Slightly incised, few areas of active erosion or unprotected banks. Majority of banks are stable (60-80%). Vegetative protection or natural rock prominent (60-80%) AND/OR Depositional features contribute to stability. The bankfull and low flow channels are well defined. Stream likely has access to bankfull benches, or newly developed floodplains along portions of the reach. Transient sediment covers 10-40% of the stream bottom.	Often incised, but less than Severe or Poor. Banks more stable than Severe or Poor due to lower bank slopes. Erosion may be present on 40-60% of both banks. Vegetative protection on 40-60% of banks. Streambanks may be vertical or undercut. AND/OR 40-60% of stream is covered by sediment. Sediment may be temporary/transient, contribute to stability. Deposition that contributes to stability, may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and depositional features which contribute to stability.	Overwidened/incised. Vertically/laterally unstable. Likely to widen further. Majority of both banks are near vertical. Erosion present on 60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in nature, and contributing to instability. AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sediment deposition is absent.	Deeply incised (or excavated), vertical/lateral instability. Severe incision, flow contained within the banks. Streambed below average rooting depth, majority of banks vertical/undercut. Vegetative protection present on less than 20% of banks, is not preventing erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel. Greater than 80% of stream bed is covered by deposition, contributing to instability. Multiple thread channels and/or subterranean flow.
Score	3	2.4	2	1.6	1

NOTES>>	Stream is located in partially forested area adjacent to roadway; low banks less than 1' high; bed and banks not well defined
---------	---

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

Conditional Category								NOTES>>
Riparian Buffers	Optimal	Suboptimal		Marginal		Poor		
	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and a non-maintained understory. Wetlands located within the riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	
			High	Low	High	Low	High	
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5	

1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors.		Ensure the sums of % Riparian Blocks equal 100
2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.		
3. Enter the % Riparian Area and Score for each riparian category in the blocks below.		

Right Bank	% Riparian Area>	100%					100%
	Score >	1.5					
Left Bank	% Riparian Area>	20%	80%				100%
	Score >	1.5	0.5				

$$CI = (\text{Sum } \% RA * \text{Scores} * 0.01) / 2$$

$$Rt \text{ Bank } CI > 1.50$$

$$Lt \text{ Bank } CI > 0.70$$

3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddedness; shade; undercut banks; root mats; SAV; riffle pool complexes, stable features.

Instream Habitat/ Available Cover	Conditional Category				NOTES>>some leafy debris observed; shade from partially forested area; no riffle / pool sequence observed; no undercut banks
	Optimal	Suboptimal	Marginal	Poor	
	Habitat elements are typically present in greater than 50% of the reach.	Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of populations.	Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of populations.	Habitat elements listed above are lacking or are unstable. Habitat elements are typically present in less than 10% of the reach.	
Score	1.5	1.2	0.9	0.5	

CI

0.90

Stream Impact Assessment Form Page 2

Project #	Applicant	Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
45612-001	VDOT	Chesapeake	R3	0208020802	2/5/2014	12	345	N/A
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock								NOTES>>stream is adjacent to roadway and exhibits very little sinuosity
Channel Alteration	Conditional Category							
	Negligible	Minor	Moderate		Severe			
	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks shored with gabion, riprap, or cement.		
	SCORE	1.5	1.3	1.1	0.9	0.7	0.5	
REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH								0.70
<small>NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.</small>								
THE REACH CONDITION INDEX (RCI) >>								0.94
<small>RCI= (Sum of all CI's)/5</small>								
COMPENSATION REQUIREMENT (CR) >>								N/A
<small>CR = RCI X LF X IF</small>								

INSERT PHOTOS:

Photo of SAR 12 looking upstream.



DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1)

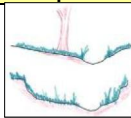
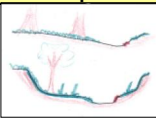
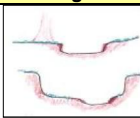
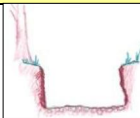
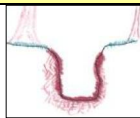
Unified Stream Methodology for use in Virginia

For use in Wadeable channels classified as intermittent or perennial

Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR #	Impact/SAR length	Impact Factor
45612-001	I-64 / High Rise Bridge Corridor Study	Chesapeake	R3	0208020802	2/6/2014	13	1039	N/A

Name(s) of Evaluator(s)	Stream Name and Information
Glenn Wilson & Dave Kwasniewski	Tributary of Goose Creek

1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation)

Channel Condition	Conditional Category				
	Optimal	Suboptimal	Marginal	Poor	Severe
					
	Very little incision or active erosion; 80-100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient sediment deposition covers less than 10% of bottom.	Slightly incised, few areas of active erosion or unprotected banks. Majority of banks are stable (60-80%). Vegetative protection or natural rock prominent (60-80%) AND/OR Depositional features contribute to stability. The bankfull and low flow channels are well defined. Stream likely has access to bankfull benches, or newly developed floodplains along portions of the reach. Transient sediment covers 10-40% of the stream bottom.	Often incised, but less than Severe or Poor. Banks more stable than Severe or Poor due to lower bank slopes. Erosion may be present on 40-60% of both banks. Vegetative protection on 40-60% of banks. Streambanks may be vertical or undercut. AND/OR 40-60% of stream is covered by sediment. Sediment may be temporary/transient, contribute to stability. Deposition that contribute to stability, may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and depositional features which contribute to stability.	Overwidened/incised. Vertically/laterally unstable. Likely to widen further. Majority of both banks are near vertical. Erosion present on 60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in nature, and contributing to instability. AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sediment deposition is absent.	Deeply incised (or excavated), vertical/lateral instability. Severe incision, flow contained within the banks. Streambed below average rooting depth, majority of banks vertical/undercut. Vegetative protection present on less than 20% of banks, is not preventing erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel. Greater than 80% of stream bed is covered by deposition, contributing to instability. Multiple thread channels and/or subterranean flow.
Score	3	2.4	2	1.6	1

CI

2.4

NOTES>>	Stream is located in partially forested area within wetlands with access to floodplain; few incised banks observed
---------	--

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

Conditional Category								NOTES>>
Riparian Buffers	Optimal	Suboptimal		Marginal		Poor		
	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and a non-maintained understory. Wetlands located within the riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	
			High	Low	High	Low	High	
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5	
<div>1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors.</div> <div>2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.</div> <div>3. Enter the % Riparian Area and Score for each riparian category in the blocks below.</div>								
Right Bank	% Riparian Area>	100%					100%	
	Score >	1.5						
Left Bank	% Riparian Area>	100%					100%	
	Score >	1.5						
CI= (Sum % RA * Scores*0.01)/2								
Rt Bank CI > 1.50								
Lt Bank CI > 1.50								

3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddedness; shade; undercut banks; root mats; SAV; riffle pools complexes, stable features.

Instream Habitat/ Available Cover	Conditional Category				NOTES>>some woody and leafy debris; some shade from partially forested area and herbaceous vegetation lining the banks; some undercut banks and long runs observed
	Optimal	Suboptimal	Marginal	Poor	
	Habitat elements are typically present in greater than 50% of the reach.	Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of populations.	Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of populations.	Habitat elements listed above are lacking or are unstable. Habitat elements are typically present in less than 10% of the reach.	
Score	1.5	1.2	0.9	0.5	

CI

1.20

Stream Impact Assessment Form Page 2

Project #	Applicant	Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
45612-001	VDOT	Chesapeake	R3	0208020802	2/5/2014	13	1039	N/A

4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock							NOTES>>stream flows through culvert on downstream end
Channel Alteration	Conditional Category						
	Negligible	Minor		Moderate		Severe	
	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks shored with gabion, riprap, or cement.	
SCORE	1.5	1.3	1.1	0.9	0.7	0.5	

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

1.28

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

INSERT PHOTOS:

Photo of SAR 13 looking downstream.



DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1)

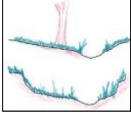
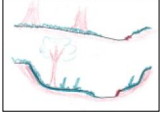
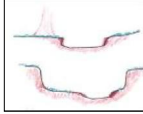
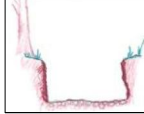

Unified Stream Methodology for use in Virginia

For use in Wadeable channels classified as intermittent or perennial

Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR #	Impact/SAR length	Impact Factor
45612-001	I-64 / High Rise Bridge Corridor Study	Chesapeake	R3	0208020802	2/7/2014	14	1527	N/A

Name(s) of Evaluator(s)	Stream Name and Information
Glenn Wilson & Dave Kwasniewski	Tributary of Deep Creek

1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation)

Channel Condition	Conditional Category				
	Optimal	Suboptimal	Marginal	Poor	Severe
					
	Very little incision or active erosion; 80-100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient sediment deposition covers less than 10% of bottom.	Slightly incised, few areas of active erosion or unprotected banks. Majority of banks are stable (60-80%). Vegetative protection or natural rock prominent (60-80%) AND/OR Depositional features contribute to stability. The bankfull and low flow channels are well defined. Stream likely has access to bankfull benches, or newly developed floodplains along portions of the reach. Transient sediment covers 10-40% of the stream bottom.	Often incised, but less than Severe or Poor. Banks more stable than Severe or Poor due to lower bank slopes. Erosion may be present on 40-60% of both banks. Vegetative protection on 40-60% of banks. Streambanks may be vertical or undercut. AND/OR 40-60% of stream is covered by sediment. Sediment may be temporary/transient, contribute to stability. Deposition that contribute to stability, may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and depositional features which contribute to stability.	Overwidened/incised. Vertically/laterally unstable. Likely to widen further. Majority of both banks are near vertical. Erosion present on 60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in nature, and contributing to instability. AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sediment deposition is absent.	Deeply incised (or excavated), vertical/lateral instability. Severe incision, flow contained within the banks. Streambed below average rooting depth, majority of banks vertical/undercut. Vegetative protection present on less than 20% of banks, is not preventing erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel. Greater than 80% of stream bed is covered by deposition, contributing to instability. Multiple thread channels and/or subterranean flow.
Score	3	2.4	2	1.6	1

NOTES>>	Stream is located in partially forested residential area; banks relatively stable with little herbaceous vegetation observed
---------	--

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

Conditional Category								NOTES>>
Riparian Buffers	Optimal	Suboptimal		Marginal		Poor		
	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and a non-maintained understory. Wetlands located within the riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	
			High	Low	High	Low	High	
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5	
<div>1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors.</div> <div>2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.</div> <div>3. Enter the % Riparian Area and Score for each riparian category in the blocks below.</div>								
Right Bank	% Riparian Area>	15%	85%				100%	
	Score >	1.5	0.6					
CI= (Sum % RA * Scores*0.01)/2								
Left Bank	% Riparian Area>	5%	95%				100%	
	Score >	1.5	0.6					
Rt Bank CI >								
0.74								
Lt Bank CI >								
0.65								

3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddedness; shade; undercut banks; root mats; SAV; riffle pool complexes, stable features.

Instream Habitat/ Available Cover	Conditional Category				NOTES>>few root mats and leafy debris observed; some shade from partially forested areas lining the banks; few undercut banks observed; some riffle / pool complexes
	Optimal	Suboptimal	Marginal	Poor	
	Habitat elements are typically present in greater than 50% of the reach.	Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of populations.	Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of populations.	Habitat elements listed above are lacking or are unstable. Habitat elements are typically present in less than 10% of the reach.	
Score	1.5	1.2	0.9	0.5	

CI

2.4

CI

0.69

CI

1.20

Stream Impact Assessment Form Page 2

Project #	Applicant	Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	
45612-001	VDOT	Chesapeake	R3	0208020802	2/5/2014	14	1527	N/A	
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock							NOTES>>stream flows through culvert under roadways; some banks along residential area are armored with concrete / brick		
Channel Alteration	Conditional Category								
	Negligible	Minor	Moderate		Severe				
	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks shored with gabion, riprap, or cement.			
	SCORE	1.5	1.3	1.1	0.9	0.7			0.5
REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH							0.90		
NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.							THE REACH CONDITION INDEX (RCI) >>		1.04
							RCI= (Sum of all CI's)/5		
							COMPENSATION REQUIREMENT (CR) >>		N/A
							CR = RCI X LF X IF		

INSERT PHOTOS:

Photo of SAR 14 looking downstream.



DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1)

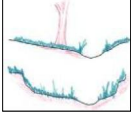
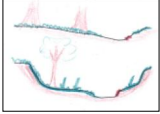
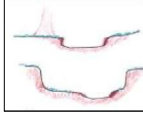
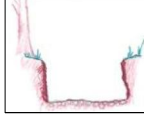

Unified Stream Methodology for use in Virginia

For use in Wadeable channels classified as intermittent or perennial

Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR #	Impact/SAR length	Impact Factor
45612-001	I-64 / High Rise Bridge Corridor Study	Chesapeake	R3	0208020802	4/22/2014	15	921	N/A

Name(s) of Evaluator(s)	Stream Name and Information
Glenn Wilson & Dave Kwasniewski	Tributary of Goose Creek

1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation)

Channel Condition	Conditional Category				
	Optimal	Suboptimal	Marginal	Poor	Severe
					
	Very little incision or active erosion; 80-100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient sediment deposition covers less than 10% of bottom.	Slightly incised, few areas of active erosion or unprotected banks. Majority of banks are stable (60-80%). Vegetative protection or natural rock prominent (60-80%) AND/OR Depositional features contribute to stability. The bankfull and low flow channels are well defined. Stream likely has access to bankfull benches, or newly developed floodplains along portions of the reach. Transient sediment covers 10-40% of the stream bottom.	Often incised, but less than Severe or Poor. Banks more stable than Severe or Poor due to lower bank slopes. Erosion may be present on 40-60% of both banks. Vegetative protection on 40-60% of banks. Streambanks may be vertical or undercut. AND/OR 40-60% of stream is covered by sediment. Sediment may be temporary/transient, contribute to stability. Deposition that contribute to stability, may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and depositional features which contribute to stability.	Overwidened/incised. Vertically/laterally unstable. Likely to widen further. Majority of both banks are near vertical. Erosion present on 60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in nature, and contributing to instability. AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sediment deposition is absent.	Deeply incised (or excavated), vertical/lateral instability. Severe incision, flow contained within the banks. Streambed below average rooting depth, majority of banks vertical/undercut. Vegetative protection present on less than 20% of banks, is not preventing erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel. Greater than 80% of stream bed is covered by deposition, contributing to instability. Multiple thread channels and/or subterranean flow.
Score	3	2.4	2	1.6	1

CI

2.0

NOTES>>	Stream is located adjacent to a container storage facility; banks relatively stable with little herbaceous vegetation observed
---------	--

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

Conditional Category								NOTES>>
Riparian Buffers	Optimal	Suboptimal		Marginal		Poor		
	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and a non-maintained understory. Wetlands located within the riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	
			High	Low	High	Low	High	
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5	
<div>1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors.</div> <div>2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.</div> <div>3. Enter the % Riparian Area and Score for each riparian category in the blocks below.</div>								
Right Bank	% Riparian Area>	50%	50%				100%	
	Score >	1.5	0.5					
Left Bank	% Riparian Area>	75%	25%				100%	
	Score >	0.5	1.5					
Cl= (Sum % RA * Scores*0.01)/2								
Lt Bank Cl > 0.75								

CI= (Sum % RA * Scores*0.01)/2

Rt Bank CI > 1.00

Lt Bank CI > 0.75

CI

0.88

3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddedness; shade; undercut banks; root mats; SAV; riffle pool complexes, stable features.

Instream Habitat/ Available Cover	Conditional Category				NOTES>>high amount of sediment deposition, minimal riffle pool sequence, some woody debris and leaf pack
	Optimal	Suboptimal	Marginal	Poor	
	Habitat elements are typically present in greater than 50% of the reach.	Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of populations.	Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of populations.	Habitat elements listed above are lacking or are unstable. Habitat elements are typically present in less than 10% of the reach.	
Score	1.5	1.2	0.9	0.5	

CI

1.20

Stream Impact Assessment Form Page 2

Project #	Applicant	Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
45612-001	VDOT	Chesapeake	R3	0208020802	2/5/2014	15	921	N/A

4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock

NOTES>>ditched channel located between I-64 and private parcel

Channel Alteration	Conditional Category				
	Negligible	Minor	Moderate	Severe	
	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.
SCORE	1.5	1.3	1.1	0.9	0.7

Greater than 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks shored with gabion, riprap, or cement.

0.50

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

0.92

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

INSERT PHOTOS:

Photo of SAR 15 looking upstream.



DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1)

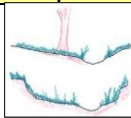
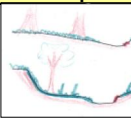
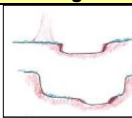
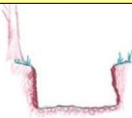

Unified Stream Methodology for use in Virginia

For use in Wadeable channels classified as intermittent or perennial

Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR #	Impact/SAR length	Impact Factor
45612-001	I-64 / High Rise Bridge Corridor Study	Chesapeake	R3	0208020802	4/22/2014	16	444	N/A

Name(s) of Evaluator(s)	Stream Name and Information
Glenn Wilson & Dave Kwasniewski	Tributary to Newton Creek

1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation)

Channel Condition	Conditional Category				
	Optimal	Suboptimal	Marginal	Poor	Severe
					
	Very little incision or active erosion; 80-100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient sediment deposition covers less than 10% of bottom.	Slightly incised, few areas of active erosion or unprotected banks. Majority of banks are stable (60-80%). Vegetative protection or natural rock prominent (60-80%) AND/OR Depositional features contribute to stability. The bankfull and low flow channels are well defined. Stream likely has access to bankfull benches, or newly developed floodplains along portions of the reach. Transient sediment covers 10-40% of the stream bottom.	Often incised, but less than Severe or Poor. Banks more stable than Severe or Poor due to lower bank slopes. Erosion may be present on 40-60% of both banks. Vegetative protection on 40-60% of banks. Streambanks may be vertical or undercut. AND/OR 40-60% of stream is covered by sediment. Sediment may be temporary/transient, contribute to stability. Deposition that contribute to stability, may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and depositional features which contribute to stability.	Overwidened/incised. Vertically/laterally unstable. Likely to widen further. Majority of both banks are near vertical. Erosion present on 60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in nature, and contributing to instability. AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sediment deposition is absent.	Deeply incised (or excavated), vertical/lateral instability. Severe incision, flow contained within the banks. Streambed below average rooting depth, majority of banks vertical/undercut. Vegetative protection present on less than 20% of banks, is not preventing erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel. Greater than 80% of stream bed is covered by deposition, contributing to instability. Multiple thread channels and/or subterranean flow.
Score	3	2.4	2	1.6	1

NOTES>>	Stream is located in both a residential (upstream) and forested (downstream) area; banks relatively stable with herbaceous vegetation (lawn) observed
---------	---

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

Conditional Category								NOTES>>
Riparian Buffers	Optimal	Suboptimal		Marginal		Poor		
	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and a non-maintained understory. Wetlands located within the riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	
			High	Low	High	Low	High	
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5	
1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors. 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below. 3. Enter the % Riparian Area and Score for each riparian category in the blocks below.						Ensure the sums of % Riparian Blocks equal 100		
Right Bank	% Riparian Area>	50%	25%	25%			100%	
	Score >	0.6	1.2	0.75				
CI= (Sum % RA * Scores*0.01)/2								
Left Bank	% Riparian Area>	50%	25%	25%			100%	
	Score >	0.6	1.2	0.75				
Rt Bank CI > 0.79								
Lt Bank CI > 0.79								

3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddedness; shade; undercut banks; root mats; SAV; riffle pool complexes, stable features.

Instream Habitat/ Available Cover	Conditional Category				NOTES>>high amount of sediment deposition, minimal riffle pool sequence, some woody debris and leaf pack
	Optimal	Suboptimal	Marginal	Poor	
	Habitat elements are typically present in greater than 50% of the reach.	Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of populations.	Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of populations.	Habitat elements listed above are lacking or are unstable. Habitat elements are typically present in less than 10% of the reach.	
Score	1.5	1.2	0.9	0.5	

CI

2.0

CI

0.90

Stream Impact Assessment Form Page 2

Project #	Applicant	Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
45612-001	VDOT	Chesapeake	R3	0208020802	2/5/2014	16	444	N/A

4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock

Channel Alteration	Conditional Category					SCORE	
	Negligible	Minor	Moderate		Severe		
	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.		Greater than 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks shored with gabion, riprap, or cement.
	1.5	1.3	1.1	0.9	0.7	0.5	0.70

NOTES>>ditched channel located between I-64 and private parcel

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

0.88

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

INSERT PHOTOS:

Photo of SAR 16 looking upstream.



Photo of SAR 16 looking downstream.



DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1)

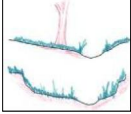
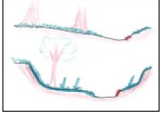
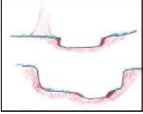
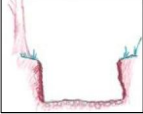

Unified Stream Methodology for use in Virginia

For use in Wadeable channels classified as intermittent or perennial

Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR #	Impact/SAR length	Impact Factor
45612-001	I-64 / High Rise Bridge Corridor Study	Chesapeake	R3	0208020802	4/22/2014	17	284	N/A

Name(s) of Evaluator(s)	Stream Name and Information
Glenn Wilson & Dave Kwasniewski	Tributary to Newton Creek

1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation)

Channel Condition	Conditional Category				
	Optimal	Suboptimal	Marginal	Poor	Severe
					
	Very little incision or active erosion; 80-100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient sediment deposition covers less than 10% of bottom.	Slightly incised, few areas of active erosion or unprotected banks. Majority of banks are stable (60-80%). Vegetative protection or natural rock prominent (60-80%) AND/OR Depositional features contribute to stability. The bankfull and low flow channels are well defined. Stream likely has access to bankfull benches, or newly developed floodplains along portions of the reach. Transient sediment covers 10-40% of the stream bottom.	Often incised, but less than Severe or Poor. Banks more stable than Severe or Poor due to lower bank slopes. Erosion may be present on 40-60% of both banks. Vegetative protection on 40-60% of banks. Streambanks may be vertical or undercut. AND/OR 40-60% of stream is covered by sediment. Sediment may be temporary/transient, contribute to instability. Deposition that contribute to stability, may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and depositional features which contribute to stability.	Overwidened/incised. Vertically/laterally unstable. Likely to widen further. Majority of both banks are near vertical. Erosion present on 60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in nature, and contributing to instability. AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sediment deposition is absent.	Deeply incised (or excavated), vertical/lateral instability. Severe incision, flow contained within the banks. Streambed below average rooting depth, majority of banks vertical/undercut. Vegetative protection present on less than 20% of banks, is not preventing erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel. Greater than 80% of stream bed is covered by deposition, contributing to instability. Multiple thread channels and/or subterranean flow.
Score	3	2.4	2	1.6	1

NOTES>>	Stream is located in forested residential area; banks relatively stable with herbaceous vegetation and some woody species observed
---------	--

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

Conditional Category								NOTES>>
Riparian Buffers	Optimal	Suboptimal		Marginal		Poor		
	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and a non-maintained understory. Wetlands located within the riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	
			High	Low	High	Low	High	
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5	
1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors. 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below. 3. Enter the % Riparian Area and Score for each riparian category in the blocks below.						Ensure the sums of % Riparian Blocks equal 100		
Right Bank	% Riparian Area>	100%					100%	
	Score >	0.85						
Left Bank	% Riparian Area>	90%	10%				100%	
	Score >	0.6	1.5					
Cl= (Sum % RA * Scores*0.01)/2								
Rt Bank Cl > 0.85								
Lt Bank Cl > 0.69								

3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddedness; shade; undercut banks; root mats; SAV; riffle pools complexes, stable features.

Instream Habitat/ Available Cover	Conditional Category				NOTES>>
	Optimal	Suboptimal	Marginal	Poor	
	Habitat elements are typically present in greater than 50% of the reach.	Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of populations.	Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of populations.	Habitat elements listed above are lacking or are unstable. Habitat elements are typically present in less than 10% of the reach.	
Score	1.5	1.2	0.9	0.5	

CI

CI

1.20

Stream Impact Assessment Form Page 2

Project #	Applicant	Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
45612-001	VDOT	Chesapeake	R3	0208020802	2/5/2014	17	284	N/A

4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock

NOTES>>

Channel Alteration	Conditional Category				
	Negligible	Minor	Moderate	Severe	
	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.
SCORE	1.5	1.3	1.1	0.9	0.7

Greater than 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks shored with gabion, riprap, or cement.

1.10

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

1.09

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

N/A

CR = RCI X LF X IF

INSERT PHOTOS:

Photo of SAR 17 looking downstream.



DESCRIBE PROPOSED IMPACT:

APPENDIX D: SURVEYED WETLANDS AND STREAMS

- I 64/High Rise Bridge Corridor Study Area*
- Water Bodies
- Railroad
- Stream Area Reach (SAR)

- Wetlands in Study Area**
- E2EM
 - PEM
 - PFO

Figure D1: Surveyed Wetlands and Streams

Sheet 1 of 6

Interstate 64/High Rise Bridge Corridor Study
Environmental Assessment
City of Chesapeake

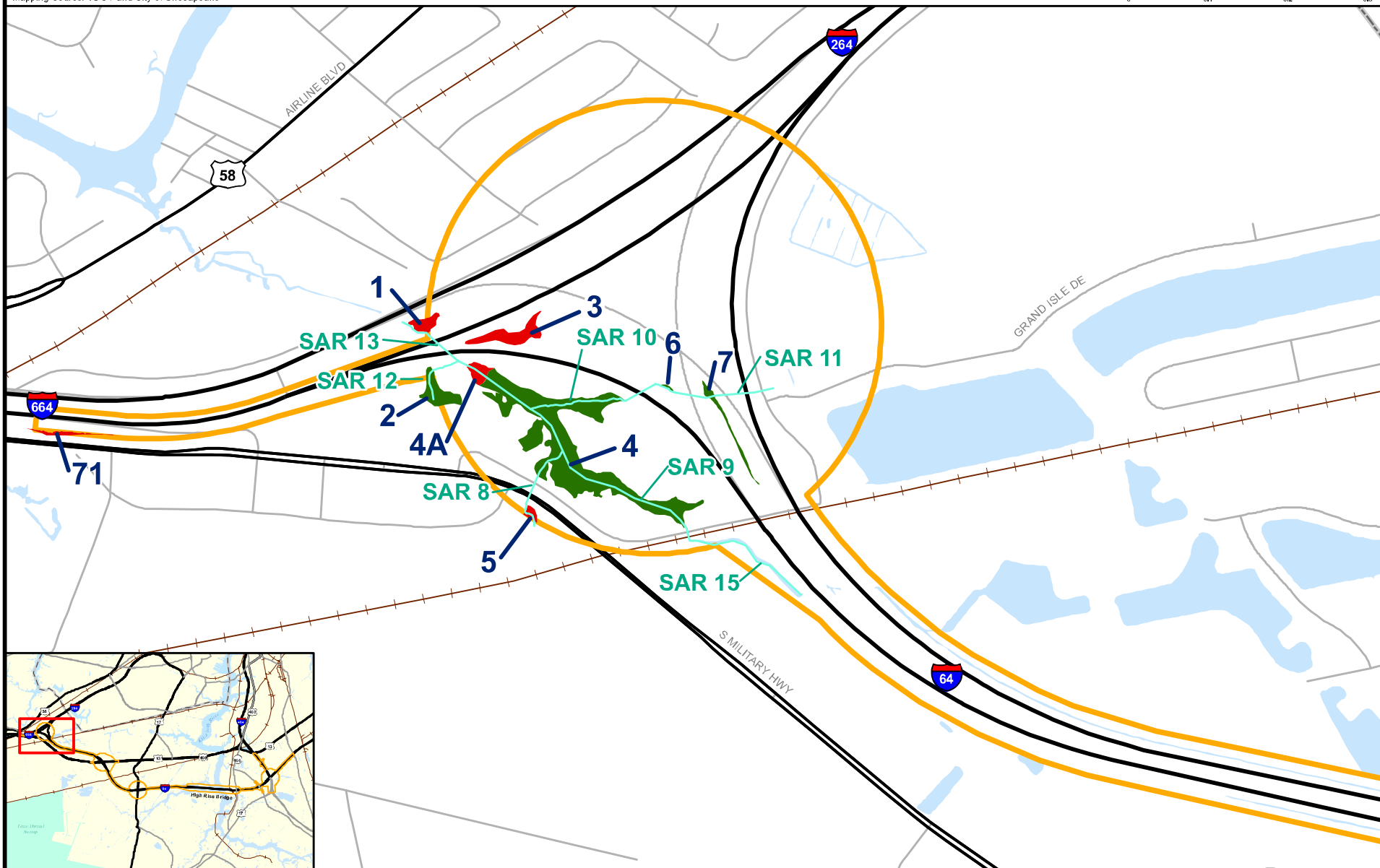
State Project Number: 0064-131-783, P101; UPC: 104366
Federal Project Number: NH-IM-064-3(481)



*The study area is a buffer around the road corridor that includes all natural, cultural and physical resources that must be analyzed in the NEPA document. It does not imply right-of-way take or construction impact.

Mapping Source: VDOT and City of Chesapeake

0 0.1 0.2 0.3 Miles



- I 64/High Rise Bridge Corridor Study Area*
- Water Bodies
- Railroad

- Wetlands in Study Area**
- E2EM
 - PEM
 - PFO

Figure D2: Surveyed Wetlands and Streams

Sheet 2 of 6

Interstate 64/High Rise Bridge Corridor Study
Environmental Assessment
City of Chesapeake

State Project Number: 0064-131-783, P101; UPC: 104366
Federal Project Number: NH-IM-064-3(481)

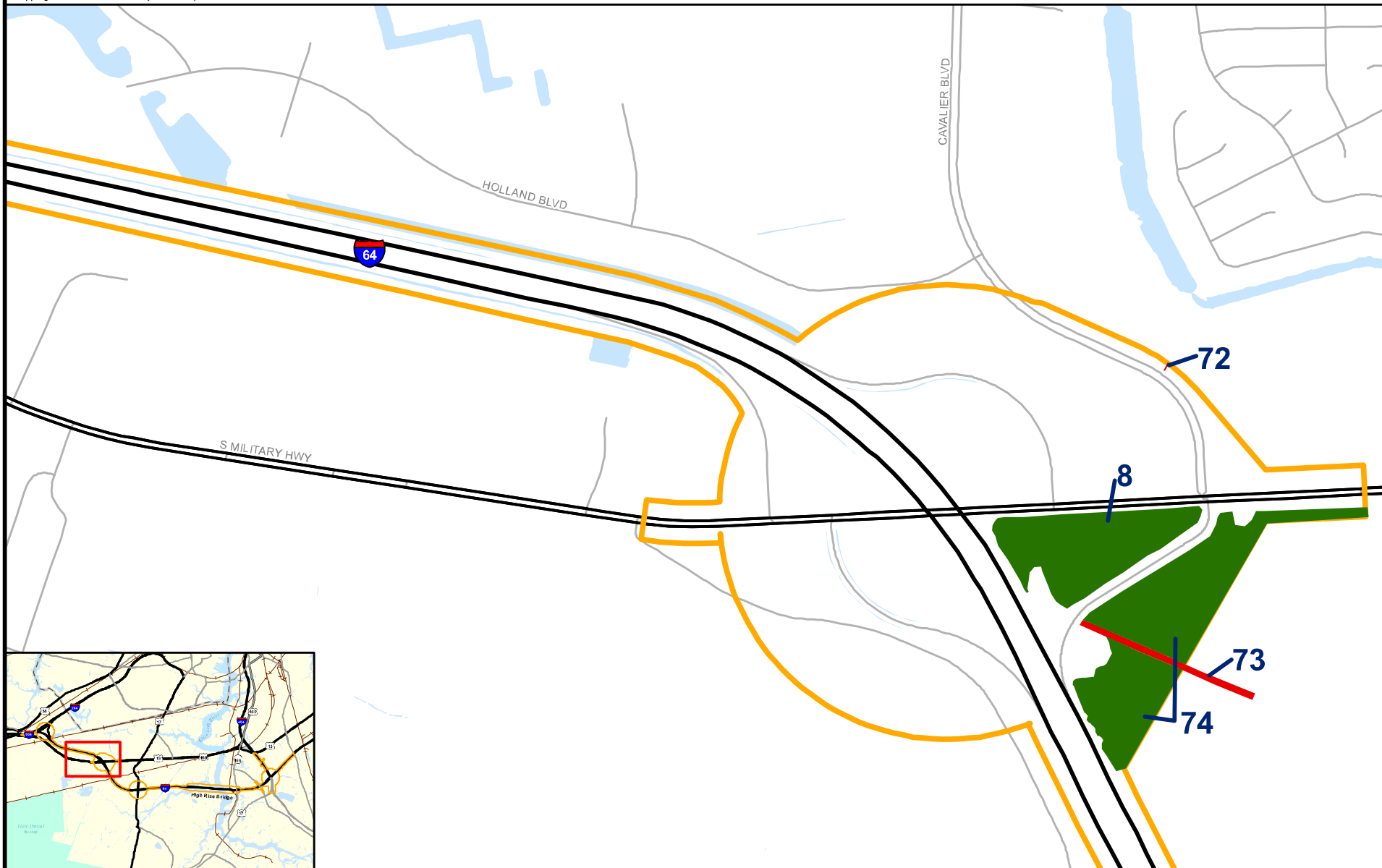


VDOT Virginia Department of Transportation

*The study area is a buffer around the road corridor that includes all natural, cultural and physical resources that must be analyzed in the NEPA document. It does not imply right-of-way take or construction impact.

Mapping Source: VDOT and City of Chesapeake

0 0.1 0.2 0.3 Miles



- I 64/High Rise Bridge Corridor Study Area*
- Water Bodies
- Railroad
- Stream Area Reach (SAR)

- Wetlands in Study Area**
- E2EM
 - PEM
 - PFO

Figure D3: Surveyed Wetlands and Streams

Sheet 3 of 6

Interstate 64/High Rise Bridge Corridor Study
Environmental Assessment
City of Chesapeake

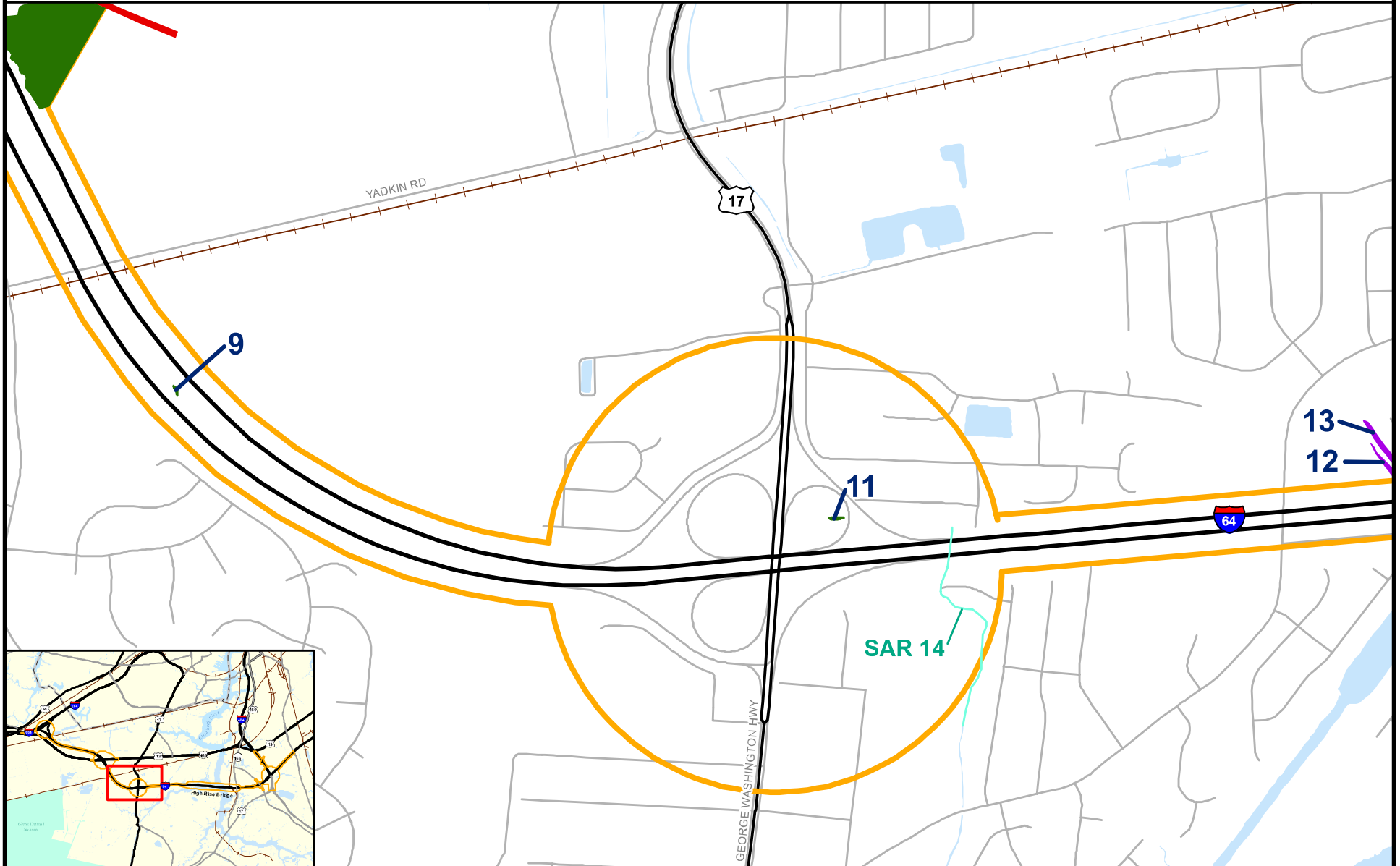
State Project Number: 0064-131-783, P101; UPC: 104366
Federal Project Number: NH-IM-064-3(481)






*The study area is a buffer around the road corridor that includes all natural, cultural and physical resources that must be analyzed in the NEPA document. It does not imply right-of-way take or construction impact.

Mapping Source: VDOT and City of Chesapeake

0 0.1 0.2 0.3 Miles



-  I 64/High Rise Bridge Corridor Study Area*
-  Water Bodies
-  Railroad




- Wetlands in Study Area**
-  E2EM
 -  PEM
 -  PFO

Figure D4: Surveyed Wetlands and Streams

Sheet 4 of 6

Interstate 64/High Rise Bridge Corridor Study
Environmental Assessment
City of Chesapeake

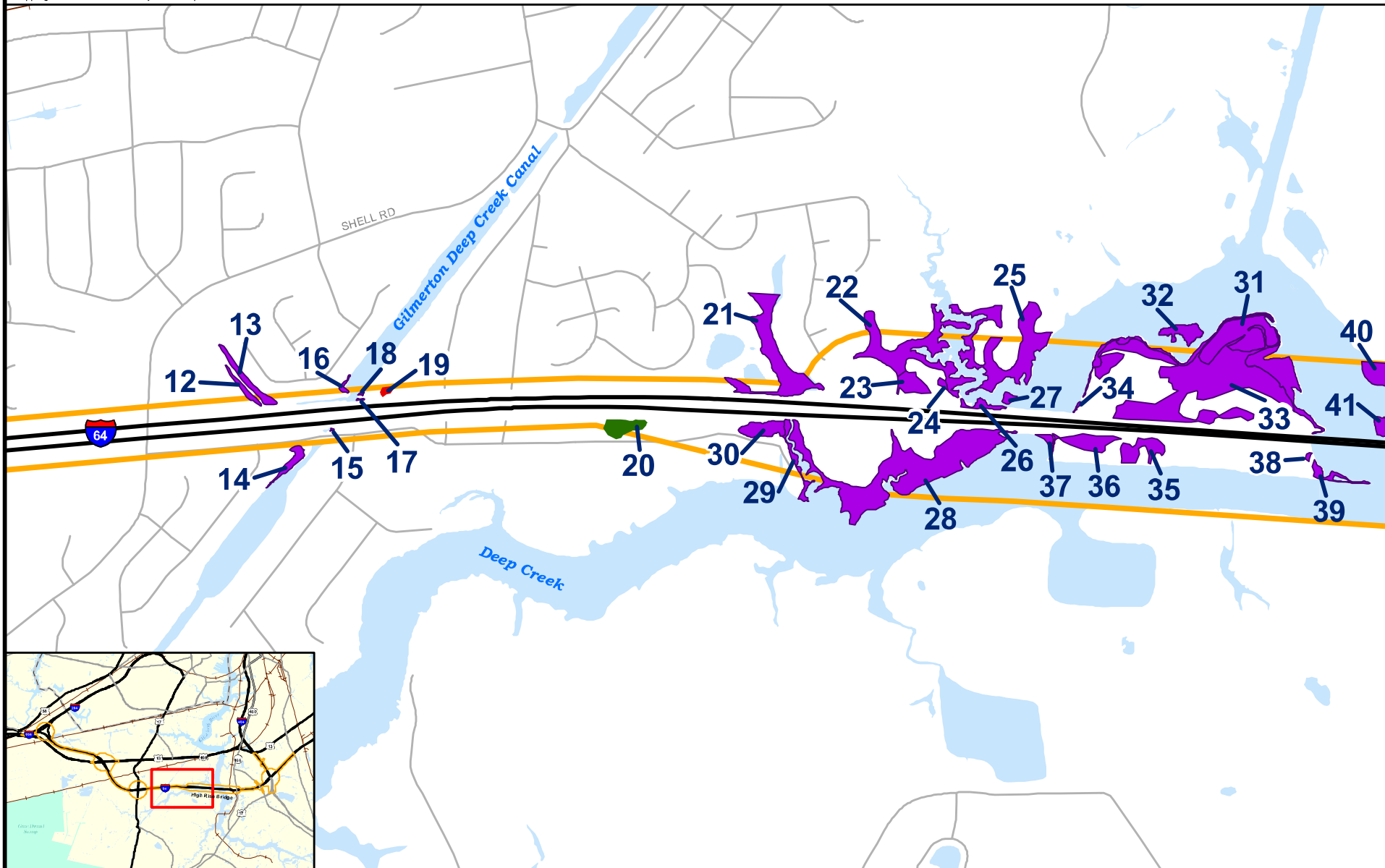
State Project Number: 0064-131-783, P101; UPC: 104366
Federal Project Number: NH-IM-064-3(481)



*The study area is a buffer around the road corridor that includes all natural, cultural and physical resources that must be analyzed in the NEPA document. It does not imply right-of-way take or construction impact.

Mapping Source: VDOT and City of Chesapeake

0 0.1 0.2 0.3 Miles



- I 64/High Rise Bridge Corridor Study Area*
- Water Bodies
- Railroad

- Wetlands in Study Area**
- E2EM
 - PEM
 - PFO

Figure D5: Surveyed Wetlands and Streams

Sheet 5 of 6

Interstate 64/High Rise Bridge Corridor Study
Environmental Assessment
City of Chesapeake

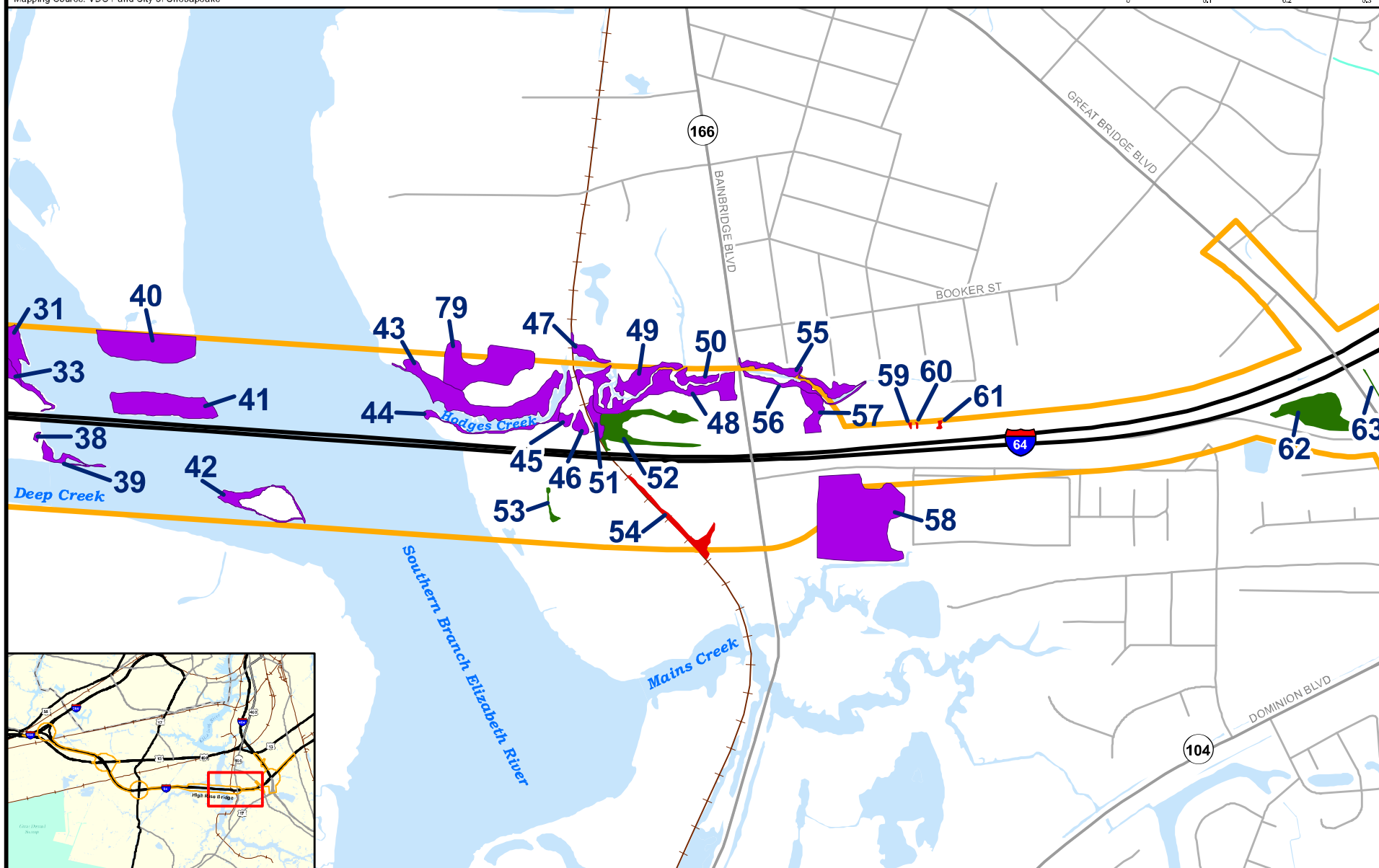
State Project Number: 0064-131-783, P101; UPC: 104366
Federal Project Number: NH-IM-064-3(481)



*The study area is a buffer around the road corridor that includes all natural, cultural and physical resources that must be analyzed in the NEPA document. It does not imply right-of-way take or construction impact.

Mapping Source: VDOT and City of Chesapeake

0 0.1 0.2 0.3 Miles



- I 64/High Rise Bridge Corridor Study Area*
- Water Bodies
- Railroad
- Stream Area Reach (SAR)

- Wetlands in Study Area**
- E2EM
 - PEM
 - PFO

Figure D6: Surveyed Wetlands and Streams

Sheet 6 of 6

Interstate 64/High Rise Bridge Corridor Study
Environmental Assessment
City of Chesapeake

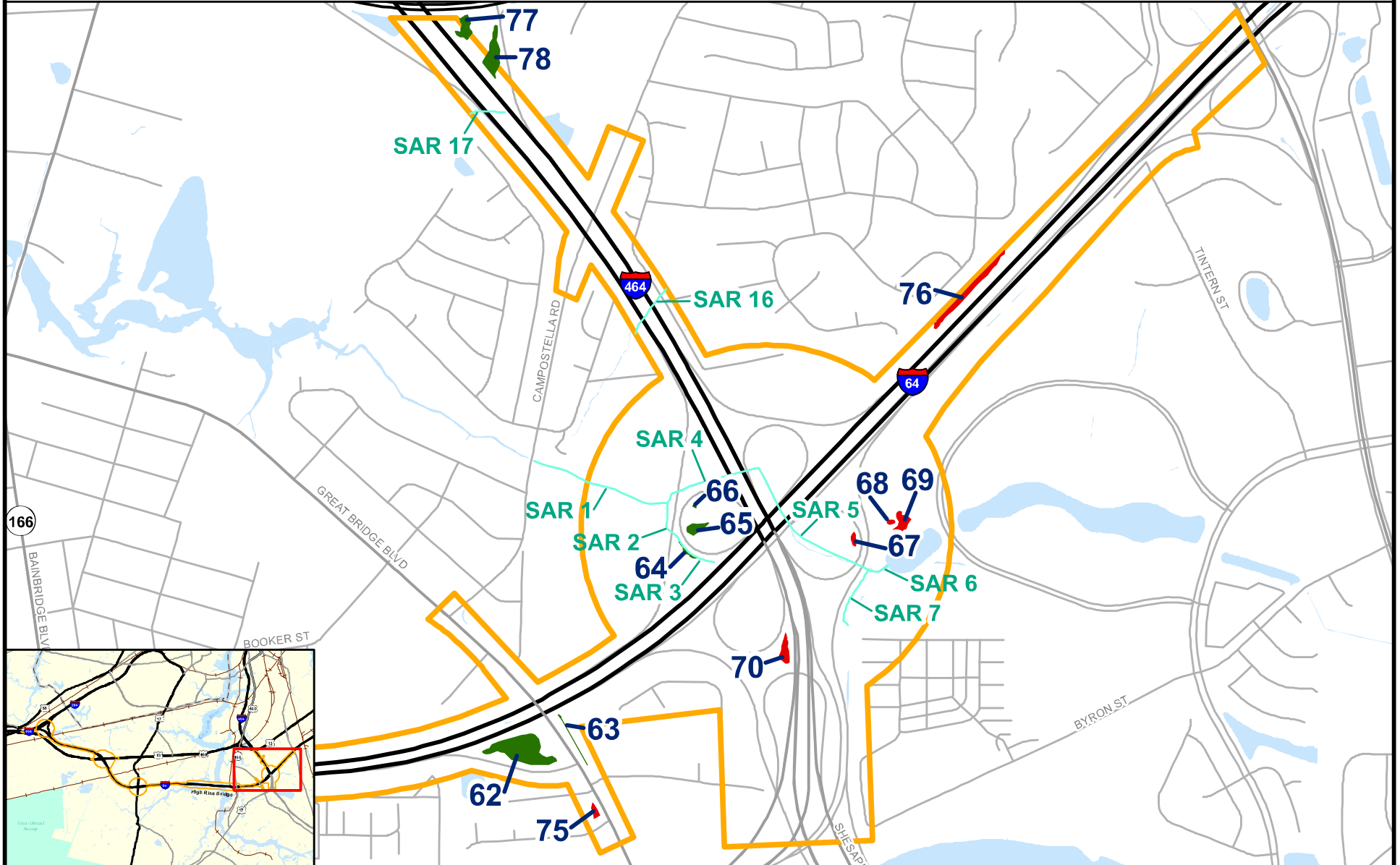
State Project Number: 0064-131-783, P101; UPC: 104366
Federal Project Number: NH-IM-064-3(481)



*The study area is a buffer around the road corridor that includes all natural, cultural and physical resources that must be analyzed in the NEPA document. It does not imply right-of-way take or construction impact.

Mapping Source: VDOT and City of Chesapeake

0 0.1 0.2 0.3 Miles



APPENDIX E: VaFWIS DATABASE SEARCH

VaFWIS - Department of Game and Inland Fisheries

36,46,54.0 -76,23,34.0

is the Search Point

Submit

Cancel

Search Point

☒ Change to "clicked" map point

☐ Fixed at 36,46,54.0 - 76,23,34.0

Show Position Rings

☒ Yes ☐ No

1 mile and 1/4 mile at the Search Point

Show Search Area

☒ Yes ☐ No

2 Search distance miles radius

Search Point is at map center

Base Map Choices

Topography

Map Overlay Choices

Current List: Position, Search

Map Overlay Legend

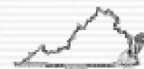


Position Rings
1 mile and 1/4 mile at the Search Point



2 mile radius Search Area

Virginia Fish and Wildlife Information Service



Map Click

Pan

Id

M

Map Scale

In

Zoom

Out

Screen Size

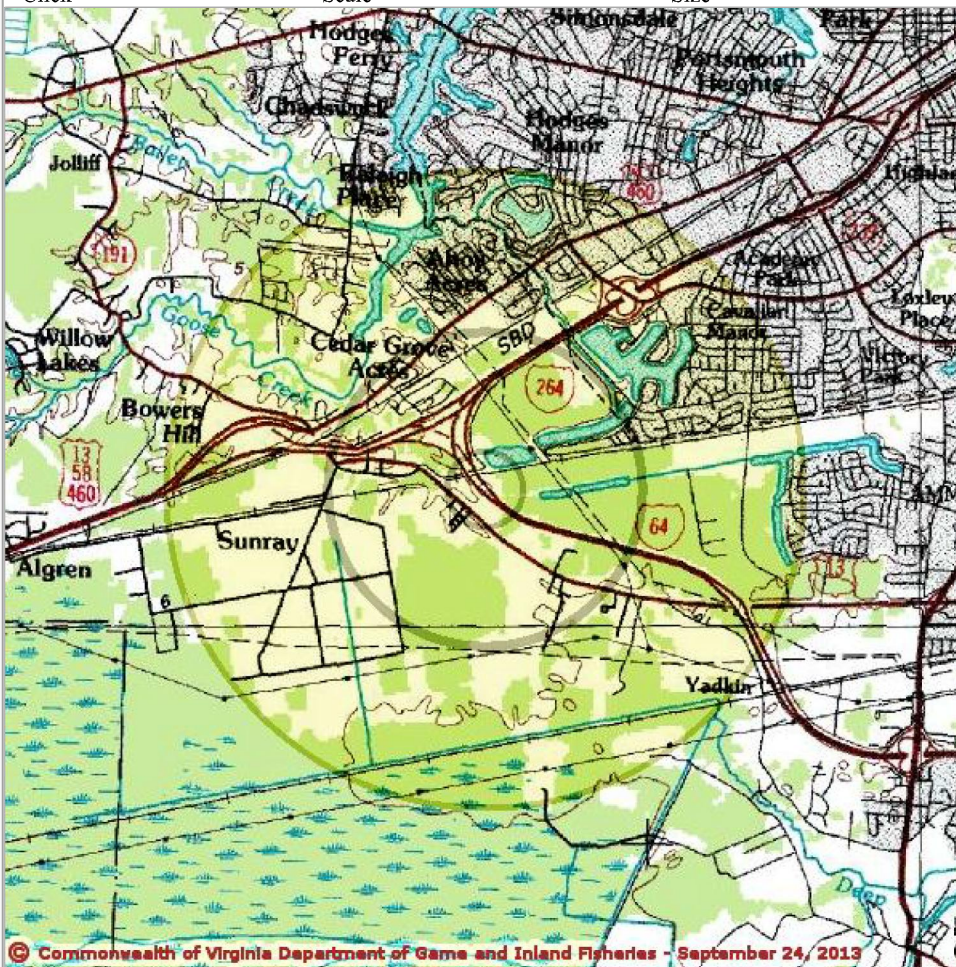
Small

Size

Big

Help

Refresh Browser Page



N

1 0 1 2 3 4 Kilometers
1 0 1 2 3 4 Miles

Point of Search 36,46,54.0 -76,23,34.0

Map Location 36,46,54.0 -76,23,34.0

Select **Coordinate System**: ☒ Degrees, Minutes, Seconds Latitude - Longitude

☐ Decimal Degrees Latitude - Longitude

☐ Meters UTM NAD83 East North Zone

☐ Meters UTM NAD27 East North Zone

Base Map source: USGS 1:100,000 topographic maps (see Microsoft.terraserver-usa.com for details)

Map projection is UTM Zone 18 NAD 1983 with left 370921 and top 4076357. Pixel size is 16 meters. Coordinates displayed are Degrees, Minutes, Seconds North and West. Map is currently displayed as 600 columns by 600 rows for a total of 360000 pixels. The map display represents 9600 meters east to west by 9600 meters north to south for a total of 92.1 square kilometers. The map display represents 31501 feet east to west by 31501 feet north to south for a total of 35.5 square miles.

Topographic maps and Black and white aerial photography for year 1990+-
are from the United States Department of the Interior, United States Geological Survey.
Color aerial photography aquired 2002 is from Virginia Base Mapping Program, Virginia
Geographic Information Network.
Shaded topographic maps are from TOPO! ©2006 National Geographic
<http://www.national.geographic.com/topo>
All other map products are from the Commonwealth of Virginia Department of Game and Inland
Fisheries.

map assembled 2013-09-24 08:41:46 (qa/qc December 5, 2012 8:04 - tn=490642 dist=3218
I)
\$poi=36.7816666 -76.3927777

| [DGIF](#) | [Credits](#) | [Disclaimer](#) | Contact shirl.dressler@dgif.virginia.gov | Please view our [privacy policy](#) |
© 1998- 2013 Commonwealth of Virginia Department of Game and Inland Fisheries

VaFWIS Initial Project Assessment Report

Compiled on 9/24/2013,
8:42:52 AM

[Help](#)

Known or likely to occur within a **2 mile radius around point 36,46,54.0 76,23,34.0**
in **550 Chesapeake City, 740 Portsmouth City, VA**

[View Map of
Site Location](#)

514 Known or Likely Species ordered by Status Concern for Conservation
(displaying first 34) (34 species with Status* or Tier I** or Tier II**)

BOVA Code	Status*	Tier**	Common Name	Scientific Name	Confirmed	Database(s)
010032	FESE	II	Sturgeon, Atlantic	Acipenser oxyrinchus		BOVA
030074	FESE		Turtle, Kemp's ridley sea	Lepidochelys kempii		BOVA
030071	FTST	I	Turtle, loggerhead sea	Caretta caretta		BOVA
040120	FTST	I	Plover, piping	Charadrius melodus		BOVA
040110	SE	I	Rail, black	Laterallus jamaicensis		BOVA
050034	SE	I	Bat, Rafinesque's eastern big-eared	Corynorhinus rafinesquii macrotis		BOVA
030013	SE	II	Rattlesnake, canebrake	Crotalus horridus	Yes	BOVA,Habitat,SppObs
040096	ST	I	Falcon, peregrine	Falco peregrinus		BOVA
040129	ST	I	Sandpiper, upland	Bartramia longicauda		BOVA
040293	ST	I	Shrike, loggerhead	Lanius ludovicianus		BOVA
040179	ST	I	Tern, gull-billed	Sterna nilotica		BOVA
050008	ST	IV	Shrew, Dismal Swamp southeastern	Sorex longirostris fisheri	Yes	BOVA,Habitat,SppObs
040292	ST		Shrike, migrant loggerhead	Lanius ludovicianus migrans		BOVA
010038	FC	IV	Alewife	Alosa pseudoharengus		BOVA
040144	FC	IV	Knot, red	Calidris canutus rufus		BOVA
010045	FC		Herring, blueback	Alosa aestivalis		BOVA
040093	FS	II	Eagle, bald	Haliaeetus leucocephalus	Yes	BOVA,BAEANests
100002	FS	III		Euphyes dukesii		BOVA

			Skipper, Duke's (or scarce swamp)			
030067	CC	II	Terrapin, northern diamond-backed	Malaclemys terrapin terrapin		BOVA,Habitat
030063	CC	III	Turtle, spotted	Clemmys guttata	Yes	BOVA,SppObs
040225		I	Sapsucker, yellow-bellied	Sphyrapicus varius		BOVA
040319		I	Warbler, black-throated green	Dendroica virens		BOVA
040422		I	Warbler, Wayne's	Dendroica virens waynei		Habitat
020063		II	Toad, oak	Anaxyrus quercicus		BOVA
040038		II	Bittern, American	Botaurus lentiginosus		BOVA
040052		II	Duck, American black	Anas rubripes		BOVA
040029		II	Heron, little blue	Egretta caerulea caerulea		BOVA
040105		II	Rail, king	Rallus elegans		BOVA,Habitat
040381		II	Sparrow, saltmarsh sharp-tailed	Ammodramus caudacutus		BOVA
040186		II	Tern, least	Sterna antillarum		BOVA
040187		II	Tern, royal	Sterna maxima maximus		BOVA
040320		II	Warbler, cerulean	Dendroica cerulea		BOVA
040304		II	Warbler, Swainson's	Limnothlypis swainsonii		BOVA
040266		II	Wren, winter	Troglodytes troglodytes		BOVA

To view All 514 species [View 514](#)

*FE=Federal Endangered; FT=Federal Threatened; SE=State Endangered; ST=State Threatened; FP=Federal Proposed; FC=Federal Candidate; FS=Federal Species of Concern; CC=Collection Concern

** I=VA Wildlife Action Plan - Tier I - Critical Conservation Need; II=VA Wildlife Action Plan - Tier II - Very High Conservation Need; III=VA Wildlife Action Plan - Tier III - High Conservation Need; IV=VA Wildlife Action Plan - Tier IV - Moderate Conservation Need

Bat Colonies or Hibernacula: **Not Known**

Anadromous Fish Use Streams

N/A

Colonial Water Bird Survey

N/A

Threatened and Endangered Waters

N/A

Managed Trout Streams

N/A

Bald Eagle Concentration Areas and Roosts

N/A

Bald Eagle Nests (3 records)
[View Map of All Query Results
Bald Eagle Nests](#)

Nest	N Obs	Latest Date	DGIF Nest Status	View Map
CP0301	12	Apr 25 2011	RECENTLY ACTIVE	Yes
CP0701	4	Mar 1 2008	UNKNOWN	Yes
CP0801	6	Feb 17 2010	UNKNOWN	Yes

Displayed 3 Bald Eagle Nests

Habitat Predicted for Aquatic WAP Tier I & II Species

N/A

Habitat Predicted for Terrestrial WAP Tier I & II Species (5 Species)
[View Map of Combined Terrestrial Habitat Predicted for 5 WAP Tier I & II Species Listed Below](#)

ordered by Status Concern for Conservation

BOVA Code	Status*	Tier**	Common Name	Scientific Name	View Map
030013	SE	II	Rattlesnake, canebrake	Crotalus horridus	Yes
050008	ST	IV	Shrew, Dismal Swamp southeastern	Sorex longirostris fisheri	Yes
030067	CC	II	Terrapin, northern diamond- backed	Malaclemys terrapin terrapin	Yes
040422		I	Warbler, Wayne's	Dendroica virens waynei	Yes
040105		II	Rail, king	Rallus elegans	Yes

Public HoldingsN/A

Compiled on 9/24/2013, 8:42:52 AM I490642.0 report=IPA searchType= R dist= 3218 poi= 36,46,54.0 76,23,34.0

PixelSize=64; Anadromous=0.031081; BECAR=0.025886; Bats=0.026367; Buffer=0.175744; County=0.075027; Impediments=0.026244; Init=0.212005; PublicLands=0.048024; SppObs=0.60118; TEWaters=0.042708; TierReaches=0.095567; TierTerrestrial=0.420374; Total=1.651502; Trout=0.044399

VaFWIS - Department of Game and Inland Fisheries

36,46,11.0 -76,21,49.0

is the Search Point

Submit

Cancel

Search Point

- ☒ Change to "clicked" map point
- ☐ Fixed at 36,46,11.0 - 76,21,49.0

Show Position Rings

- ☒ Yes ☐ No

1 mile and 1/4 mile at the Search Point

Show Search Area

- ☒ Yes ☐ No

2 Search distance miles radius

Search Point is at map center

Base Map Choices

Topography

Map Overlay Choices

Current List: Position, Search

Map Overlay Legend


Position Rings
1 mile and 1/4
mile at the
Search Point

2 mile radius
Search Area

Virginia Fish and Wildlife Information Service



Map Click

Pan

Id

M

Map Scale

In

Zoom

Out

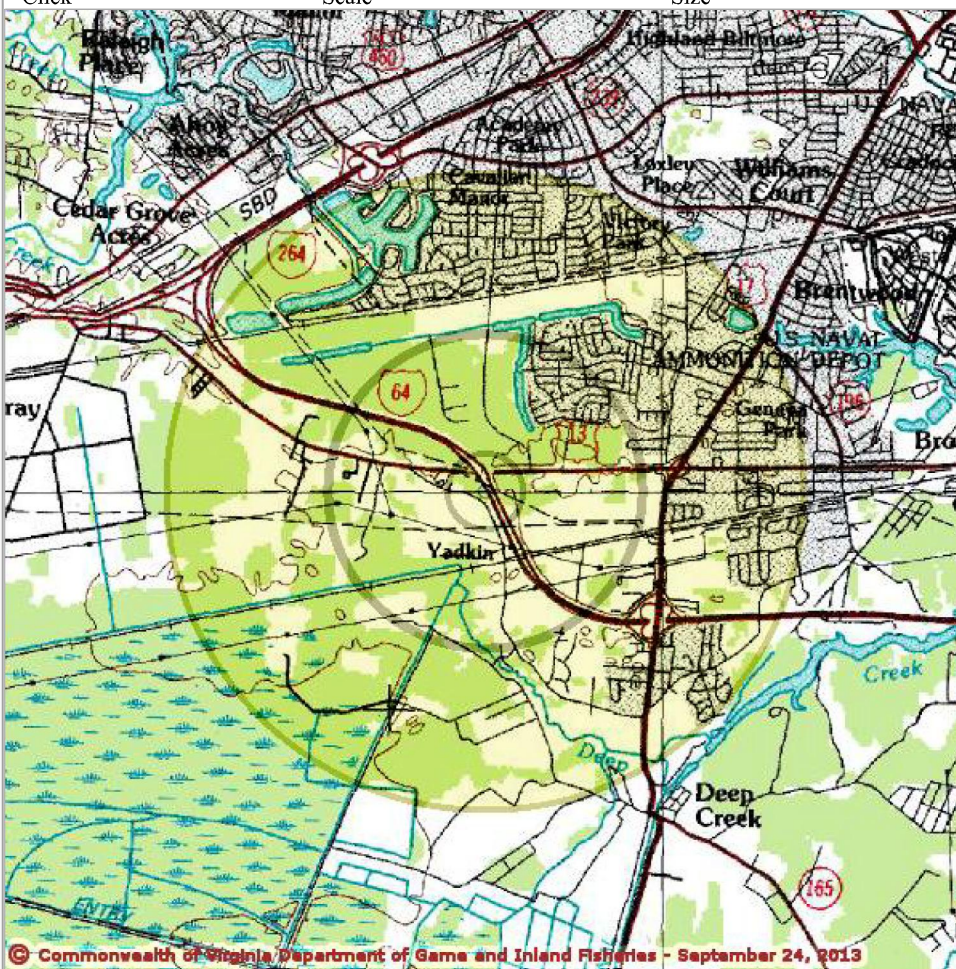
Screen Size

Small

Size

Big

Help



N

1 0 1 2 3 4 Kilometers
1 0 1 2 3 4 Miles

Point of Search 36,46,11.0 -76,21,49.0

Map Location 36,46,11.0 -76,21,49.0

Select Coordinate System: ☒ Degrees, Minutes, Seconds Latitude - Longitude

☐ Decimal Degrees Latitude - Longitude

☐ Meters UTM NAD83 East North Zone

☐ Meters UTM NAD27 East North Zone

Base Map source: USGS 1:100,000 topographic maps (see Microsoft.terraserwer-usa.com for details)

Map projection is UTM Zone 18 NAD 1983 with left 373505 and top 4074994. Pixel size is 16 meters. Coordinates displayed are Degrees, Minutes, Seconds North and West. Map is currently displayed as 600 columns by 600 rows for a total of 360000 pixels. The map display represents 9600 meters east to west by 9600 meters north to south for a total of 92.1 square kilometers. The map display represents 31501 feet east to west by 31501 feet north to south for a total of 35.5 square miles.

Topographic maps and Black and white aerial photography for year 1990+-
are from the United States Department of the Interior, United States Geological Survey.
Color aerial photography aquired 2002 is from Virginia Base Mapping Program, Virginia
Geographic Information Network.
Shaded topographic maps are from TOPO! ©2006 National Geographic
<http://www.national.geographic.com/topo>
All other map products are from the Commonwealth of Virginia Department of Game and Inland
Fisheries.

map assembled 2013-09-24 08:37:39 (qa/qc December 5, 2012 8:04 - tn=490634 dist=3218
I)
\$poi=36.7697222 -76.3636111

| [DGIF](#) | [Credits](#) | [Disclaimer](#) | Contact shirl.dressler@dgif.virginia.gov | Please view our [privacy policy](#) |
© 1998- 2013 Commonwealth of Virginia Department of Game and Inland Fisheries

VaFWIS Initial Project Assessment Report

Compiled on 9/24/2013,
8:40:11 AM

[Help](#)

Known or likely to occur within a **2 mile radius around point 36,46,11.0 76,21,49.0**
in **550 Chesapeake City, 740 Portsmouth City, VA**

[View Map of
Site Location](#)

512 Known or Likely Species ordered by Status Concern for Conservation
(displaying first 34) (34 species with Status* or Tier I** or Tier II**)

BOVA Code	Status*	Tier**	Common Name	Scientific Name	Confirmed	Database(s)
010032	FESE	II	Sturgeon, Atlantic	Acipenser oxyrinchus		BOVA
030074	FESE		Turtle, Kemp's ridley sea	Lepidochelys kempii		BOVA
030071	FTST	I	Turtle, loggerhead sea	Caretta caretta		BOVA
040120	FTST	I	Plover, piping	Charadrius melodus		BOVA
040110	SE	I	Rail, black	Laterallus jamaicensis		BOVA
050034	SE	I	Bat, Rafinesque's eastern big-eared	Corynorhinus rafinesquii macrotis		BOVA
030013	SE	II	Rattlesnake, canebrake	Crotalus horridus		BOVA,Habitat
040096	ST	I	Falcon, peregrine	Falco peregrinus		BOVA
040129	ST	I	Sandpiper, upland	Bartramia longicauda		BOVA
040293	ST	I	Shrike, loggerhead	Lanius ludovicianus		BOVA
040179	ST	I	Tern, gull-billed	Sterna nilotica		BOVA
050008	ST	IV	Shrew, Dismal Swamp southeastern	Sorex longirostris fisheri		BOVA,Habitat
040292	ST		Shrike, migrant loggerhead	Lanius ludovicianus migrans		BOVA
010038	FC	IV	Alewife	Alosa pseudoharengus		BOVA
040144	FC	IV	Knot, red	Calidris canutus rufus		BOVA
010045	FC		Herring, blueback	Alosa aestivalis		BOVA
040093	FS	II	Eagle, bald	Haliaeetus leucocephalus		BOVA
100002	FS	III	Skipper, Duke's (or scarce swamp)	Euphyes dukesi		BOVA
030067	CC	II	Terrapin, northern diamond-backed	Malaclemys terrapin terrapin		BOVA,Habitat
030063	CC	III	Turtle, spotted	Clemmys guttata		BOVA
040225		I	Sapsucker, yellow-bellied	Sphyrapicus varius		BOVA
040319		I	Warbler, black-throated green	Dendroica virens		BOVA

040422		I	Warbler, Wayne's	Dendroica virens waynei		Habitat
020063		II	Toad, oak	Anaxyrus quercicus		BOVA
040038		II	Bittern, American	Botaurus lentiginosus		BOVA
040052		II	Duck, American black	Anas rubripes		BOVA
040029		II	Heron, little blue	Egretta caerulea caerulea		BOVA
040105		II	Rail, king	Rallus elegans		BOVA,Habitat
040381		II	Sparrow, saltmarsh sharp-tailed	Ammodramus caudacutus		BOVA
040186		II	Tern, least	Sterna antillarum		BOVA
040187		II	Tern, royal	Sterna maxima maximus		BOVA
040320		II	Warbler, cerulean	Dendroica cerulea		BOVA
040304		II	Warbler, Swainson's	Limnothlypis swainsonii		BOVA
040266		II	Wren, winter	Troglodytes troglodytes		BOVA

To view All 512 species [View 512](#)

*FE=Federal Endangered; FT=Federal Threatened; SE=State Endangered; ST=State Threatened; FP=Federal Proposed; FC=Federal Candidate; FS=Federal Species of Concern; CC=Collection Concern

** I=VA Wildlife Action Plan - Tier I - Critical Conservation Need; II=VA Wildlife Action Plan - Tier II - Very High Conservation Need; III=VA Wildlife Action Plan - Tier III - High Conservation Need; IV=VA Wildlife Action Plan - Tier IV - Moderate Conservation Need

Bat Colonies or Hibernacula: **Not Known**

Anadromous Fish Use Streams

N/A

Colonial Water Bird Survey

N/A

Threatened and Endangered Waters

N/A

Managed Trout Streams

N/A

Bald Eagle Concentration Areas and Roosts

N/A

Bald Eagle Nests

N/A

Habitat Predicted for Aquatic WAP Tier I & II Species

N/A

Habitat Predicted for Terrestrial WAP Tier I & II Species (5 Species)

[View Map of Combined Terrestrial Habitat Predicted for 5 WAP Tier I & II Species Listed Below](#)

ordered by Status Concern for Conservation

BOVA Code	Status*	Tier**	Common Name	Scientific Name	View Map
030013	SE	II	Rattlesnake, canebrake	Crotalus horridus	Yes
050008	ST	IV	Shrew, Dismal Swamp southeastern	Sorex longirostris fisheri	Yes
030067	CC	II	Terrapin, northern diamond-backed	Malaclemys terrapin terrapin	Yes
040422		I	Warbler, Wayne's	Dendroica virens waynei	Yes
040105		II	Rail, king	Rallus elegans	Yes

Public Holdings: (1 names)

Name	Agency	Level
Great Dismal Swamp National Wildlife Refuge	U.S. Fish and Wildlife Service	Federal

Compiled on 9/24/2013, 8:40:11 AM I490634.0 report=IPA searchType= R dist= 3218 poi= 36,46,11.0 76,21,49.0

PixelSize=64; Anadromous=0.029334; BECAR=0.024022; Bats=0.024205; Buffer=0.175819; County=0.074193; Impediments=0.024494; Init=0.213919; PublicLands=0.050312; SppObs=0.654205; TEWaters=0.042416; TierReaches=0.112194; TierTerrestrial=0.417277; Total=1.712135; Trout=0.043881

VaFWIS - Department of Game and Inland Fisheries

36,45,33.0 -76,19,59.0

is the Search Point

Search Point

☒ Change to "clicked" map point

☐ Fixed at 36,45,33.0 - 76,19,59.0

Show Position Rings

☒ Yes ☐ No

1 mile and 1/4 mile at the Search Point

Show Search Area

☒ Yes ☐ No

2 Search distance miles radius

Search Point is at map center

Base Map Choices

Topography

Map Overlay Choices

Current List: Position, Search

Map Overlay Legend

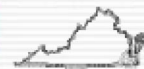


Position Rings
1 mile and 1/4 mile at the Search Point



2 mile radius Search Area

Virginia Fish and Wildlife Information Service

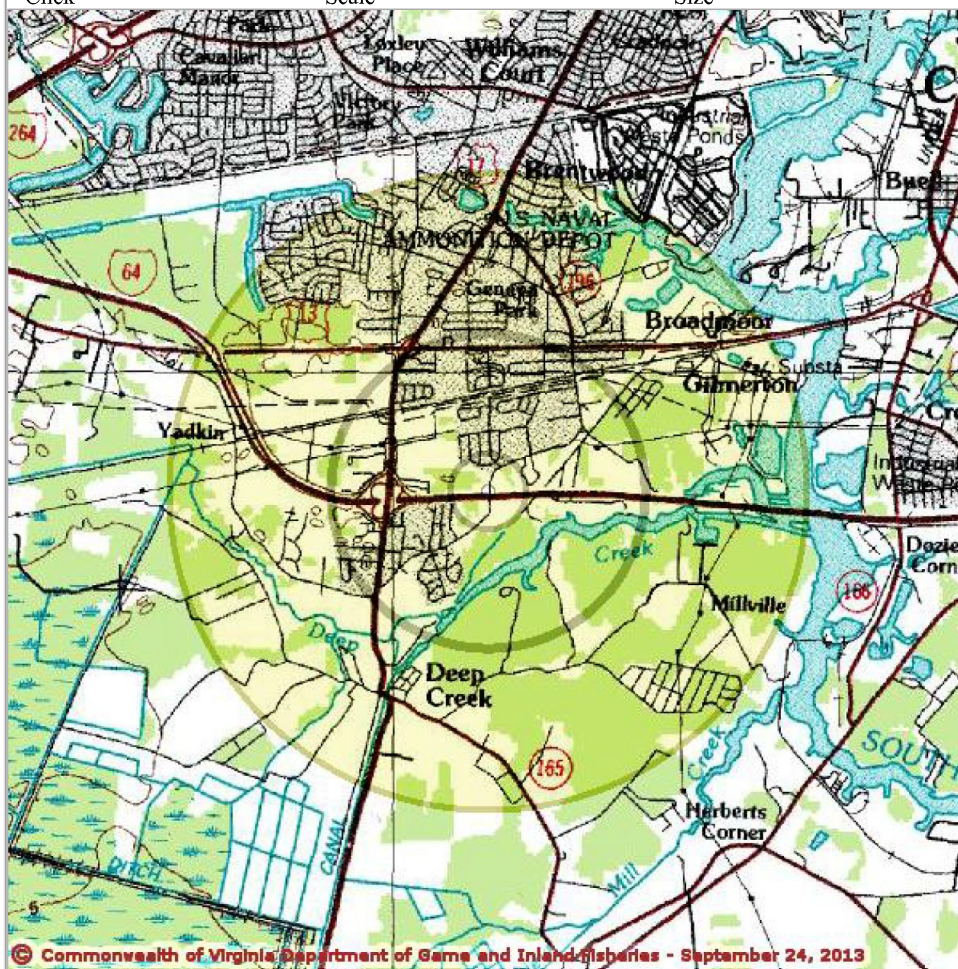


Map Click

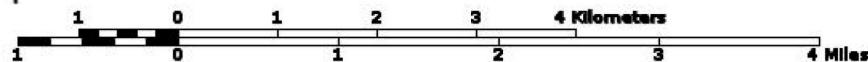
Map Scale

Screen Size

[Help](#)



N
↑



Point of Search 36,45,33.0 -76,19,59.0

Map Location 36,45,33.0 -76,19,59.0

Select **Coordinate System**: ☒ Degrees, Minutes, Seconds Latitude - Longitude

☐ Decimal Degrees Latitude - Longitude

☐ Meters UTM NAD83 East North Zone

☐ Meters UTM NAD27 East North Zone

Base Map source: USGS 1:100,000 topographic maps (see [Microsoft terraserver-usa.com](http://Microsoft.terraserver-usa.com) for details)

Map projection is UTM Zone 18 NAD 1983 with left 376216 and top 4073785. Pixel size is 16 meters. Coordinates displayed are Degrees, Minutes, Seconds North and West. Map is currently displayed as 600 columns by 600 rows for a total of 360000 pixels. The map display represents 9600 meters east to west by 9600 meters north to south for a total of 92.1 square kilometers. The map display represents 31501 feet east to west by 31501 feet north to south for a total of 35.5 square miles.

Topographic maps and Black and white aerial photography for year 1990+-
are from the United States Department of the Interior, United States Geological Survey.
Color aerial photography aquired 2002 is from Virginia Base Mapping Program, Virginia
Geographic Information Network.
Shaded topographic maps are from TOPO! ©2006 National Geographic
<http://www.national.geographic.com/topo>
All other map products are from the Commonwealth of Virginia Department of Game and Inland
Fisheries.

map assembled 2013-09-24 08:44:46 (qa/qc December 5, 2012 8:04 - tn=490645 dist=3218
I)
\$poi=36.7591666 -76.3330555

| [DGIF](#) | [Credits](#) | [Disclaimer](#) | Contact shirl.dressler@dgif.virginia.gov | Please view our [privacy policy](#) |
© 1998- 2013 Commonwealth of Virginia Department of Game and Inland Fisheries

VaFWIS Initial Project Assessment Report

Compiled on 9/24/2013,
8:46:28 AM

[Help](#)

Known or likely to occur within a **2 mile radius around point 36,45,33.0 76,19,59.0**
in **550 Chesapeake City, VA**

[View Map of
Site Location](#)

508 Known or Likely Species ordered by Status Concern for Conservation
(displaying first 30) (30 species with Status* or Tier I** or Tier II**)

BOVA Code	Status*	Tier**	Common Name	Scientific Name	Confirmed	Database(s)
010032	FESE	II	Sturgeon, Atlantic	Acipenser oxyrinchus		BOVA
030071	FTST	I	Turtle, loggerhead sea	Caretta caretta		BOVA
040110	SE	I	Rail, black	Laterallus jamaicensis		BOVA
050034	SE	I	Bat, Rafinesque's eastern big-eared	Corynorhinus rafinesquii macrotis		BOVA
030013	SE	II	Rattlesnake, canebrake	Crotalus horridus		BOVA,Habitat
040096	ST	I	Falcon, peregrine	Falco peregrinus	Yes	BOVA,SppObs
040129	ST	I	Sandpiper, upland	Bartramia longicauda		BOVA
040293	ST	I	Shrike, loggerhead	Lanius ludovicianus		BOVA
050008	ST	IV	Shrew, Dismal Swamp southeastern	Sorex longirostris fisheri		BOVA,Habitat
040292	ST		Shrike, migrant loggerhead	Lanius ludovicianus migrans		BOVA
010038	FC	IV	Alewife	Alosa pseudoharengus	Yes	BOVA,SppObs
040144	FC	IV	Knot, red	Calidris canutus rufus		BOVA
010045	FC		Herring, blueback	Alosa aestivalis	Yes	BOVA,SppObs
040093	FS	II	Eagle, bald	Haliaeetus leucocephalus		BOVA
100002	FS	III	Skipper, Duke's (or scarce swamp)	Euphyes dukesi		BOVA
030067	CC	II	Terrapin, northern diamond-backed	Malaclemys terrapin terrapin		BOVA
030063	CC	III	Turtle, spotted	Clemmys guttata		BOVA
040225		I	Sapsucker, yellow- bellied	Sphyrapicus varius		BOVA
040319		I	Warbler, black-throated green	Dendroica virens		BOVA
040422		I	Warbler, Wayne's	Dendroica virens waynei		Habitat
020063		II	Toad, oak	Anaxyrus quercicus		BOVA

040038		II	Bittern, American	Botaurus lentiginosus		BOVA
040052		II	Duck, American black	Anas rubripes		BOVA
040029		II	Heron, little blue	Egretta caerulea caerulea		BOVA
040105		II	Rail, king	Rallus elegans		BOVA,Habitat
040186		II	Tern, least	Sterna antillarum		BOVA
040187		II	Tern, royal	Sterna maxima maximus		BOVA
040320		II	Warbler, cerulean	Dendroica cerulea		BOVA
040304		II	Warbler, Swainson's	Limnothlypis swainsonii		BOVA
040266		II	Wren, winter	Troglodytes troglodytes		BOVA

To view **All 508 species** [View 508](#)

*FE=Federal Endangered; FT=Federal Threatened; SE=State Endangered; ST=State Threatened; FP=Federal Proposed;
FC=Federal Candidate; FS=Federal Species of Concern; CC=Collection Concern

** I=VA Wildlife Action Plan - Tier I - Critical Conservation Need; II=VA Wildlife Action Plan - Tier II -
Very High Conservation Need; III=VA Wildlife Action Plan - Tier III - High Conservation Need; IV=VA Wildlife Action Plan -
Tier IV - Moderate Conservation Need

Bat Colonies or Hibernacula: **Not Known**

Anadromous Fish Use Streams (1 records)

[View Map of All
Anadromous Fish Use Streams](#)

Stream ID	Stream Name	Reach Status	Anadromous Fish Species			View Map
			Different Species	Highest TE *	Highest Tier **	
C20	Elizabeth river	Confirmed	1			Yes

Impediments to Fish Passage

N/A

Colonial Water Bird Survey

N/A

Threatened and Endangered Waters

N/A

Managed Trout Streams

N/A

Bald Eagle Concentration Areas and Roosts

N/A

Bald Eagle Nests

N/A

Habitat Predicted for Aquatic WAP Tier I & II Species

N/A

Habitat Predicted for Terrestrial WAP Tier I & II Species (4 Species)

[View Map of Combined Terrestrial Habitat Predicted for 4 WAP Tier I & II Species Listed Below](#)

ordered by Status Concern for Conservation

BOVA Code	Status*	Tier**	Common Name	Scientific Name	View Map
030013	SE	II	Rattlesnake, canebrake	Crotalus horridus	Yes
050008	ST	IV	Shrew, Dismal Swamp southeastern	Sorex longirostris fisheri	Yes
040422		I	Warbler, Wayne's	Dendroica virens waynei	Yes
040105		II	Rail, king	Rallus elegans	Yes

Public Holdings: (1 names)

Name	Agency	Level
US Ammunition Depot	U.S. Dept. of Navy	Federal

Compiled on 9/24/2013, 8:46:28 AM I490645.0 report=IPA searchType= R dist= 3218 poi= 36,45,33.0 76,19,59.0

PixelSize=64; Anadromous=0.030042; BECAR=0.024282; Bats=0.024393; Buffer=0.177195; County=0.092893; Impediments=0.024533; Init=0.213243; PublicLands=0.062204; SppObs=1.022343; TEWaters=0.050941; TierReaches=0.104022; TierTerrestrial=0.476604; Total=2.180953; Trout=0.053723

VaFWIS - Department of Game and Inland Fisheries

36,45,30.0 -76,18,12.0

is the Search Point

Submit

Cancel

Search Point

☒ Change to "clicked" map point

☐ Fixed at 36,45,30.0 - 76,18,12.0

Show Position Rings

☒ Yes ☐ No

1 mile and 1/4 mile at the Search Point

Show Search Area

☒ Yes ☐ No

2 Search distance miles radius

Search Point is at map center

Base Map Choices

Topography

Map Overlay Choices

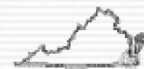
Current List: Position, Search

Map Overlay Legend


Position Rings
1 mile and 1/4
mile at the
Search Point

2 mile radius
Search Area

Virginia Fish and Wildlife Information Service



Map Click

Pan

In

Map Scale

In

Zoom

Out

Screen Size

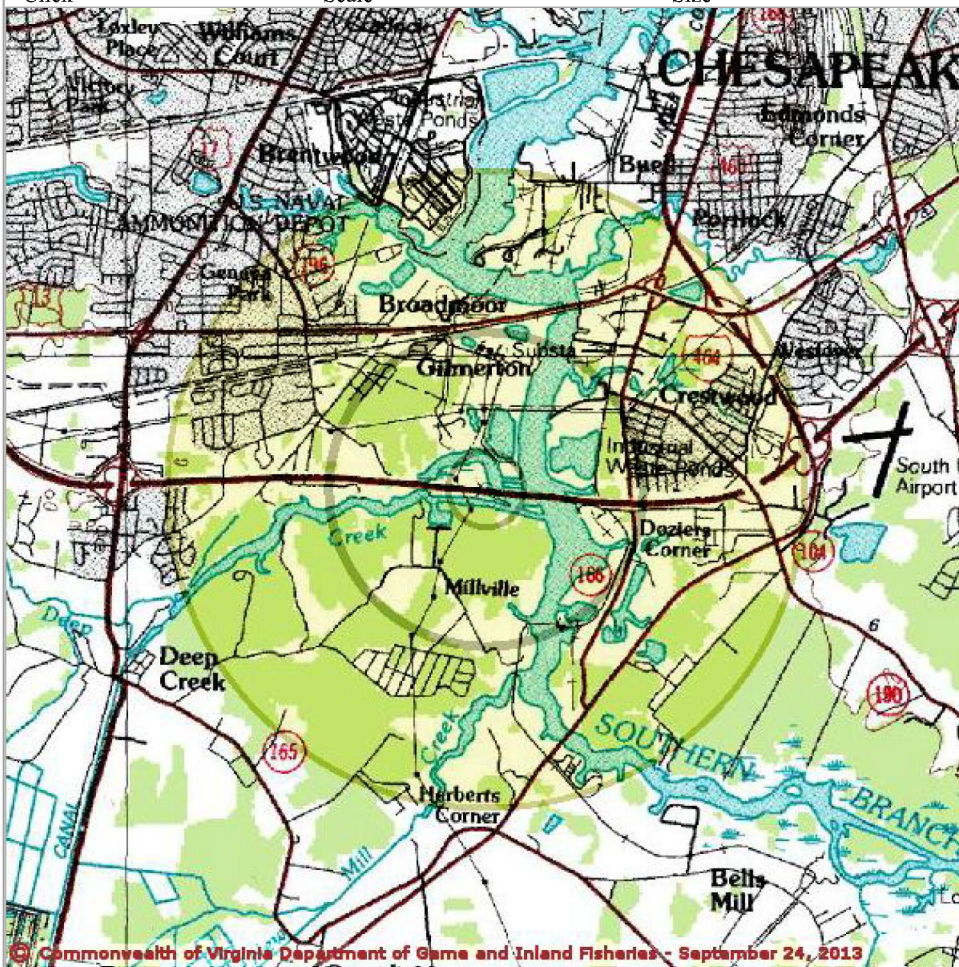
Small

Size

Big

Help

Refresh Browser Page



Commonwealth of Virginia Department of Game and Inland Fisheries - September 24, 2013

N

1 0 1 2 3 4 Kilometers
1 0 1 2 3 4 Miles

Point of Search 36,45,30.0 -76,18,12.0

Map Location 36,45,30.0 -76,18,12.0

Select Coordinate System: ☒ Degrees, Minutes, Seconds Latitude - Longitude

☐ Decimal Degrees Latitude - Longitude

☐ Meters UTM NAD83 East North Zone

☐ Meters UTM NAD27 East North Zone

Base Map source: USGS 1:100,000 topographic maps (see [Microsoft terraserver-usa.com](http://Microsoft.terraserver-usa.com) for details)

Map projection is UTM Zone 18 NAD 1983 with left 378868 and top 4073656. Pixel size is 16 meters. Coordinates displayed are Degrees, Minutes, Seconds North and West. Map is currently displayed as 600 columns by 600 rows for a total of 360000 pixels. The map display represents 9600 meters east to west by 9600 meters north to south for a total of 92.1 square kilometers. The map display represents 31501 feet east to west by 31501 feet north to south for a total of 35.5 square miles.

Topographic maps and Black and white aerial photography for year 1990+-
are from the United States Department of the Interior, United States Geological Survey.
Color aerial photography aquired 2002 is from Virginia Base Mapping Program, Virginia
Geographic Information Network.
Shaded topographic maps are from TOPO! ©2006 National Geographic
<http://www.national.geographic.com/topo>
All other map products are from the Commonwealth of Virginia Department of Game and Inland
Fisheries.

map assembled 2013-09-24 08:48:12 (qa/qc December 5, 2012 8:04 - tn=490651 dist=3218
I)
\$poi=36.7583333 -76.3033333

| [DGIF](#) | [Credits](#) | [Disclaimer](#) | Contact shirl.dressler@dgif.virginia.gov | Please view our [privacy policy](#) |
© 1998- 2013 Commonwealth of Virginia Department of Game and Inland Fisheries

VaFWIS Initial Project Assessment Report

Compiled on 9/24/2013,
8:49:26 AM

[Help](#)

Known or likely to occur within a **2 mile radius around point 36,45,30.0 76,18,12.0**
in **550 Chesapeake City, VA**

[View Map of
Site Location](#)

508 Known or Likely Species ordered by Status Concern for Conservation
(displaying first 30) (30 species with Status* or Tier I** or Tier II**)

BOVA Code	Status*	Tier**	Common Name	Scientific Name	Confirmed	Database(s)
010032	FESE	II	Sturgeon, Atlantic	Acipenser oxyrinchus		BOVA
030071	FTST	I	Turtle, loggerhead sea	Caretta caretta		BOVA
040110	SE	I	Rail, black	Laterallus jamaicensis		BOVA
050034	SE	I	Bat, Rafinesque's eastern big-eared	Corynorhinus rafinesquii macrotis		BOVA
030013	SE	II	Rattlesnake, canebrake	Crotalus horridus		BOVA,Habitat
040096	ST	I	Falcon, peregrine	Falco peregrinus	Yes	BOVA,SppObs
040129	ST	I	Sandpiper, upland	Bartramia longicauda		BOVA
040293	ST	I	Shrike, loggerhead	Lanius ludovicianus		BOVA
050008	ST	IV	Shrew, Dismal Swamp southeastern	Sorex longirostris fisheri		BOVA,Habitat
040292	ST		Shrike, migrant loggerhead	Lanius ludovicianus migrans		BOVA
010038	FC	IV	Alewife	Alosa pseudoharengus	Yes	BOVA,SppObs
040144	FC	IV	Knot, red	Calidris canutus rufus		BOVA
010045	FC		Herring, blueback	Alosa aestivalis	Yes	BOVA,SppObs
040093	FS	II	Eagle, bald	Haliaeetus leucocephalus		BOVA
100002	FS	III	Skipper, Duke's (or scarce swamp)	Euphyes dukesi		BOVA
030067	CC	II	Terrapin, northern diamond-backed	Malaclemys terrapin terrapin		BOVA
030063	CC	III	Turtle, spotted	Clemmys guttata		BOVA
040225		I	Sapsucker, yellow- bellied	Sphyrapicus varius		BOVA
040319		I	Warbler, black-throated green	Dendroica virens		BOVA
040422		I	Warbler, Wayne's	Dendroica virens waynei		Habitat
020063		II	Toad, oak	Anaxyrus quercicus		BOVA

040038		II	Bittern, American	Botaurus lentiginosus		BOVA
040052		II	Duck, American black	Anas rubripes		BOVA
040029		II	Heron, little blue	Egretta caerulea caerulea		BOVA
040105		II	Rail, king	Rallus elegans		BOVA,Habitat
040186		II	Tern, least	Sterna antillarum		BOVA
040187		II	Tern, royal	Sterna maxima maximus		BOVA
040320		II	Warbler, cerulean	Dendroica cerulea		BOVA
040304		II	Warbler, Swainson's	Limnothlypis swainsonii		BOVA
040266		II	Wren, winter	Troglodytes troglodytes		BOVA

To view **All 508 species** [View 508](#)

*FE=Federal Endangered; FT=Federal Threatened; SE=State Endangered; ST=State Threatened; FP=Federal Proposed; FC=Federal Candidate; FS=Federal Species of Concern; CC=Collection Concern

** I=VA Wildlife Action Plan - Tier I - Critical Conservation Need; II=VA Wildlife Action Plan - Tier II - Very High Conservation Need; III=VA Wildlife Action Plan - Tier III - High Conservation Need; IV=VA Wildlife Action Plan - Tier IV - Moderate Conservation Need

Bat Colonies or Hibernacula: **Not Known**

Anadromous Fish Use Streams (1 records)

[View Map of All
Anadromous Fish Use Streams](#)

Stream ID	Stream Name	Reach Status	Anadromous Fish Species			View Map
			Different Species	Highest TE *	Highest Tier **	
C20	Elizabeth river	Confirmed	1			Yes

Impediments to Fish Passage

N/A

Colonial Water Bird Survey

N/A

Threatened and Endangered Waters

N/A

Managed Trout Streams

N/A

Bald Eagle Concentration Areas and Roosts

N/A

Bald Eagle Nests

N/A

Habitat Predicted for Aquatic WAP Tier I & II Species

N/A

Habitat Predicted for Terrestrial WAP Tier I & II Species (4 Species)

[View Map of Combined Terrestrial Habitat Predicted for 4 WAP Tier I & II Species Listed Below](#)

ordered by Status Concern for Conservation

BOVA Code	Status*	Tier**	Common Name	Scientific Name	View Map
030013	SE	II	Rattlesnake, canebrake	Crotalus horridus	Yes
050008	ST	IV	Shrew, Dismal Swamp southeastern	Sorex longirostris fisheri	Yes
040422		I	Warbler, Wayne's	Dendroica virens waynei	Yes
040105		II	Rail, king	Rallus elegans	Yes

Public Holdings: (1 names)

Name	Agency	Level
US Ammunition Depot	U.S. Dept. of Navy	Federal

Compiled on 9/24/2013, 8:49:26 AM I490651.0 report=IPA searchType= R dist= 3218 poi= 36,45,30.0 76,18,12.0

PixelSize=64; Anadromous=0.030654; BECAR=0.023604; Bats=0.016107; Buffer=0.179307; County=0.075611; Impediments=0.024766; Init=0.215762; PublicLands=0.052152; SppObs=0.749901; TEWaters=0.043597; TierReaches=0.104931; TierTerrestrial=0.453225; Total=1.837443; Trout=0.045276

VaFWIS - Department of Game and Inland Fisheries

36,45,32.0 -76,16,29.0

is the Search Point

Search Point

☒ Change to "clicked" map point

☐ Fixed at 36,45,32.0 - 76,16,29.0

Show Position Rings

☒ Yes ☐ No

1 mile and 1/4 mile at the Search Point

Show Search Area

☒ Yes ☐ No

2 Search distance miles radius

Search Point is at map center

Base Map [Choices](#)

Topography

Map Overlay [Choices](#)

Current List: Position, Search

Map Overlay Legend

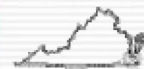


Position Rings
1 mile and 1/4 mile at the Search Point



2 mile radius Search Area

Virginia Fish and Wildlife Information Service



Map Click

Pan

Id

M

Map Scale

In

Zoom

Out

Screen Size

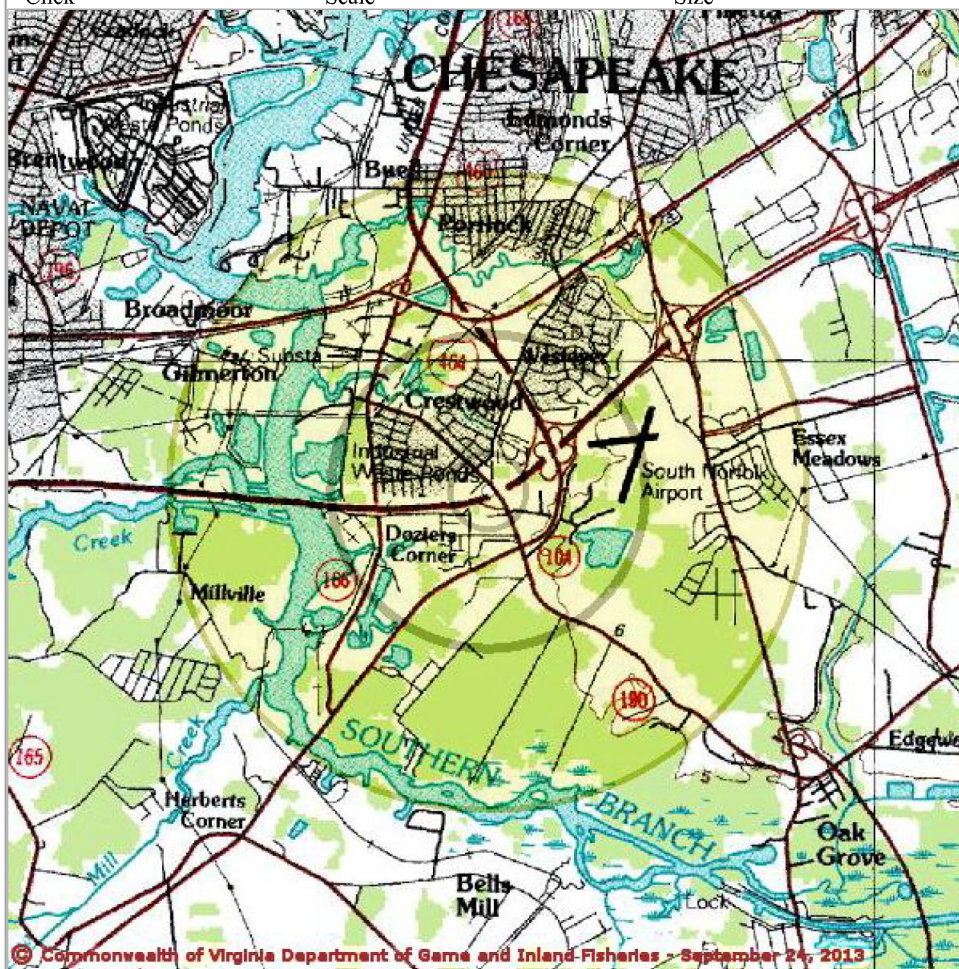
Small

Size

Big

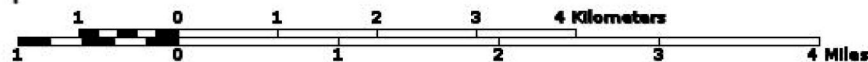
[Help](#)

[Refresh Browser Page](#)



© Commonwealth of Virginia Department of Game and Inland Fisheries - September 24, 2013

N
↑



Point of Search 36,45,32.0 -76,16,29.0

Map Location 36,45,32.0 -76,16,29.0

Select **Coordinate System**: ☒ Degrees, Minutes, Seconds Latitude - Longitude

☐ Decimal Degrees Latitude - Longitude

☐ Meters UTM NAD83 East North Zone

☐ Meters UTM NAD27 East North Zone

Base Map source: USGS 1:100,000 topographic maps (see [Microsoft terraserver-usa.com](http://Microsoft.terraserver-usa.com) for details)

Map projection is UTM Zone 18 NAD 1983 with left 381422 and top 4073683. Pixel size is 16 meters. Coordinates displayed are Degrees, Minutes, Seconds North and West. Map is currently displayed as 600 columns by 600 rows for a total of 360000 pixels. The map display represents 9600 meters east to west by 9600 meters north to south for a total of 92.1 square kilometers. The map display represents 31501 feet east to west by 31501 feet north to south for a total of 35.5 square miles.

Topographic maps and Black and white aerial photography for year 1990+-
are from the United States Department of the Interior, United States Geological Survey.
Color aerial photography aquired 2002 is from Virginia Base Mapping Program, Virginia
Geographic Information Network.
Shaded topographic maps are from TOPO! ©2006 National Geographic
<http://www.national.geographic.com/topo>
All other map products are from the Commonwealth of Virginia Department of Game and Inland
Fisheries.

map assembled 2013-09-24 08:51:01 (qa/qc December 5, 2012 8:04 - tn=490652 dist=3218
I)
\$poi=36.7588888 -76.2747222

| [DGIF](#) | [Credits](#) | [Disclaimer](#) | Contact shirl.dressler@dgif.virginia.gov | Please view our [privacy policy](#) |
© 1998- 2013 Commonwealth of Virginia Department of Game and Inland Fisheries

VaFWIS Initial Project Assessment Report

Compiled on 9/24/2013,
8:52:20 AM

[Help](#)

Known or likely to occur within a **2 mile radius around point 36,45,32.0 76,16,29.0**
in **550 Chesapeake City, VA**

[View Map of
Site Location](#)

507 Known or Likely Species ordered by Status Concern for Conservation
(displaying first 30) (30 species with Status* or Tier I** or Tier II**)

BOVA Code	Status*	Tier**	Common Name	Scientific Name	Confirmed	Database(s)
010032	FESE	II	Sturgeon, Atlantic	Acipenser oxyrinchus		BOVA
030071	FTST	I	Turtle, loggerhead sea	Caretta caretta		BOVA
040110	SE	I	Rail, black	Laterallus jamaicensis		BOVA
050034	SE	I	Bat, Rafinesque's eastern big-eared	Corynorhinus rafinesquii macrotis		BOVA
030013	SE	II	Rattlesnake, canebrake	Crotalus horridus		BOVA,Habitat
040096	ST	I	Falcon, peregrine	Falco peregrinus	Yes	BOVA,SppObs
040129	ST	I	Sandpiper, upland	Bartramia longicauda		BOVA
040293	ST	I	Shrike, loggerhead	Lanius ludovicianus		BOVA
050008	ST	IV	Shrew, Dismal Swamp southeastern	Sorex longirostris fisheri		BOVA,Habitat
040292	ST		Shrike, migrant loggerhead	Lanius ludovicianus migrans		BOVA
010038	FC	IV	Alewife	Alosa pseudoharengus	Yes	BOVA,SppObs
040144	FC	IV	Knot, red	Calidris canutus rufus		BOVA
010045	FC		Herring, blueback	Alosa aestivalis	Yes	BOVA,SppObs
040093	FS	II	Eagle, bald	Haliaeetus leucocephalus		BOVA
100002	FS	III	Skipper, Duke's (or scarce swamp)	Euphyes dukesi		BOVA
030067	CC	II	Terrapin, northern diamond-backed	Malaclemys terrapin terrapin		BOVA
030063	CC	III	Turtle, spotted	Clemmys guttata		BOVA
040225		I	Sapsucker, yellow- bellied	Sphyrapicus varius		BOVA
040319		I	Warbler, black-throated green	Dendroica virens		BOVA
040422		I	Warbler, Wayne's	Dendroica virens waynei		Habitat
020063		II	Toad, oak	Anaxyrus quercicus		BOVA

040038		II	Bittern, American	Botaurus lentiginosus		BOVA
040052		II	Duck, American black	Anas rubripes		BOVA
040029		II	Heron, little blue	Egretta caerulea caerulea		BOVA
040105		II	Rail, king	Rallus elegans		BOVA,Habitat
040186		II	Tern, least	Sterna antillarum		BOVA
040187		II	Tern, royal	Sterna maxima maximus		BOVA
040320		II	Warbler, cerulean	Dendroica cerulea		BOVA
040304		II	Warbler, Swainson's	Limnothlypis swainsonii		BOVA
040266		II	Wren, winter	Troglodytes troglodytes		BOVA

To view All 507 species [View 507](#)

*FE=Federal Endangered; FT=Federal Threatened; SE=State Endangered; ST=State Threatened; FP=Federal Proposed;
FC=Federal Candidate; FS=Federal Species of Concern; CC=Collection Concern

** I=VA Wildlife Action Plan - Tier I - Critical Conservation Need; II=VA Wildlife Action Plan - Tier II -
Very High Conservation Need; III=VA Wildlife Action Plan - Tier III - High Conservation Need; IV=VA Wildlife Action Plan -
Tier IV - Moderate Conservation Need

Bat Colonies or Hibernacula: **Not Known**

Anadromous Fish Use Streams (1 records)

[View Map of All
Anadromous Fish Use Streams](#)

Stream ID	Stream Name	Reach Status	Anadromous Fish Species			View Map
			Different Species	Highest TE *	Highest Tier **	
C20	Elizabeth river	Confirmed	1			Yes

Impediments to Fish Passage

N/A

Colonial Water Bird Survey

N/A

Threatened and Endangered Waters

N/A

Managed Trout Streams

N/A

Bald Eagle Concentration Areas and Roosts

N/A

Bald Eagle Nests

N/A

Habitat Predicted for Aquatic WAP Tier I & II Species

N/A

Habitat Predicted for Terrestrial WAP Tier I & II Species (4 Species)

[View Map of Combined Terrestrial Habitat Predicted for 4 WAP Tier I & II Species Listed Below](#)

ordered by Status Concern for Conservation

BOVA Code	Status*	Tier**	Common Name	Scientific Name	View Map
030013	SE	II	Rattlesnake, canebrake	Crotalus horridus	Yes
050008	ST	IV	Shrew, Dismal Swamp southeastern	Sorex longirostris fisheri	Yes
040422		I	Warbler, Wayne's	Dendroica virens waynei	Yes
040105		II	Rail, king	Rallus elegans	Yes

Public Holdings:

N/A

Compiled on 9/24/2013, 8:52:20 AM I490652.0 report=IPA searchType= R dist= 3218 poi= 36,45,32.0 76,16,29.0

PixelSize=64; Anadromous=0.032554; BECAR=0.026164; Bats=0.030961; Buffer=0.179067; County=0.064804; Impediments=0.024468; Init=0.21629; PublicLands=0.052589; SppObs=0.640538; TEWaters=0.046172; TierReaches=0.107818; TierTerrestrial=0.439105; Total=1.727745; Trout=0.044593

APPENDIX F: USFWS IPaC SYSTEM SEARCH



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
6669 Short Lane
Gloucester, Virginia 23061



Date: September 24, 2013

Online Project Review Certification Letter

Project Name: I-64 Widening and High Rise Bridge Replacement

Dear Applicant:

Thank you for using the U.S. Fish and Wildlife Service (Service) Virginia Field Office online project review process. By printing this letter in conjunction with your project review package, you are certifying that you have completed the online project review process for the referenced project in accordance with all instructions provided, using the best available information to reach your conclusions. This letter, and the enclosed project review package, completes the review of your project in accordance with the Endangered Species Act of 1973 (16 U.S.C. 1531-1544, 87 Stat. 884), as amended (ESA), and the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c, 54 Stat. 250), as amended (Eagle Act). This letter also provides information for your project review under the National Environmental Policy Act of 1969 (P.L. 91-190, 42 U.S.C. 4321-4347, 83 Stat. 852), as amended. A copy of this letter and the project review package must be submitted to this office for this certification to be valid. This letter and the project review package will be maintained in our records.

The species conclusions table in the enclosed project review package summarizes your ESA and Eagle Act conclusions. These conclusions resulted in “no effect” and/or “not likely to adversely affect” determinations for listed species and critical habitat and/or “no Eagle Act permit required” determinations for eagles regarding potential effects of your proposed project. We certify that the use of the online project review process in strict accordance with the instructions provided as documented in the enclosed project review package results in reaching the appropriate determinations. Therefore, we concur with the “no effect” and “not likely to adversely affect” determinations for listed species and critical habitat and “no Eagle Act permit required” determinations for eagles. Additional coordination with this office is not needed.

Candidate species are not legally protected pursuant to the ESA. However, the Service encourages consideration of these species by avoiding adverse impacts to them. Please contact this office for additional coordination if your project action area contains candidate species.

Should project plans change or if additional information on the distribution of listed species, critical habitat, or bald eagles becomes available, this determination may be reconsidered. This certification letter is valid for one year.

Applicant

Page 2

Information about the online project review process including instructions and use, species information, and other information regarding project reviews within Virginia is available at our website http://www.fws.gov/northeast/virginiafield/endspecies/project_reviews.html. If you have any questions, please contact Kimberly Smith of this office at (804) 693-6694, extension 124.

Sincerely,

/s/ Cynthia A. Schulz

Cindy Schulz
Supervisor
Virginia Field Office

Enclosures - project review package



United States Department of the Interior



FISH AND WILDLIFE SERVICE
VIRGINIA ECOLOGICAL SERVICES FIELD OFFICE
6669 SHORT LANE
GLOUCESTER, VA 23061
PHONE: (804)693-6694 FAX: (804)693-9032
URL: www.fws.gov/northeast/virginiafield/

Consultation Tracking Number: 05E2VA00-2013-SLI-2714

September 24, 2013

Project Name: I-64 Widening & Bridge Replacement

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project.

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, and proposed species, designated critical habitat, and candidate species that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having

similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment



United States Department of Interior
Fish and Wildlife Service

Project name: I-64 Widening & Bridge Replacement

Official Species List

Provided by:

VIRGINIA ECOLOGICAL SERVICES FIELD OFFICE

6669 SHORT LANE

GLOUCESTER, VA 23061

(804) 693-6694

<http://www.fws.gov/northeast/virginiafield/>

Consultation Tracking Number: 05E2VA00-2013-SLI-2714

Project Type: Transportation

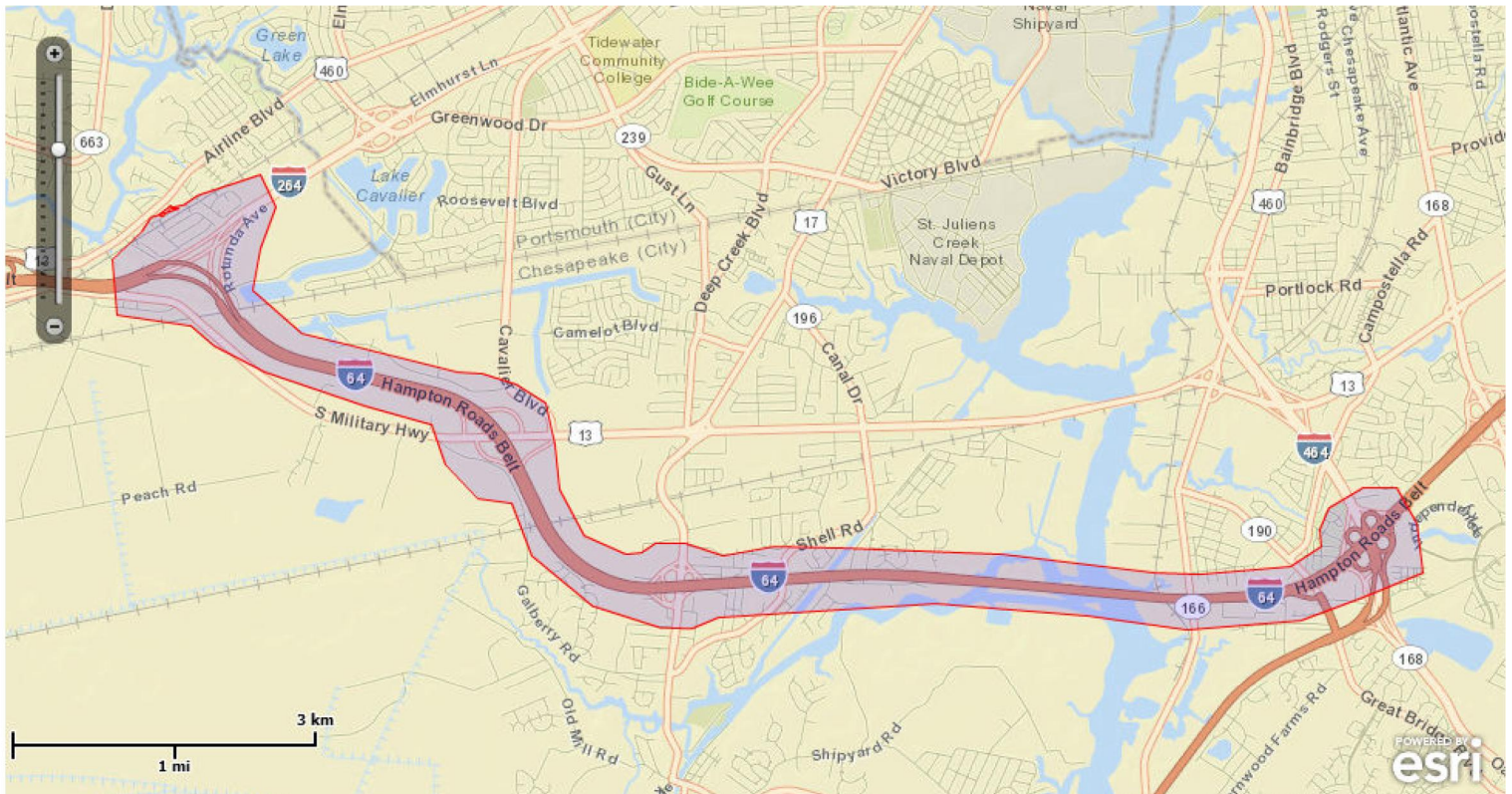
Project Description: I-64 proposed to be widened by adding additional lanes from the I-264/I-664 interchange to the east approximately 8 miles to the I-464 interchange and replacing the drawbridge over the Southern Branch of the Elizabeth River. Also includes interchange improvements.



United States Department of Interior
Fish and Wildlife Service

Project name: I-64 Widening & Bridge Replacement

Project Location Map:



Project Coordinates: MULTIPOLYGON (((-76.40113749 36.79227647, -76.40169173 36.79184009, -76.40258604 36.79161776, -76.4012119 36.7924498, -76.40113749 36.79227647)), ((-76.40258604 36.79161776, -76.4026195 36.7915975, -76.4021045 36.7915151, -76.40169173 36.79184009, -76.400345 36.7921749, -76.4011175 36.7922299, -76.40113749 36.79227647, -76.4010831 36.7923193, -76.40086 36.7923124, -76.3997613 36.7925255, -76.3982421 36.793364, -76.3912641 36.795206, -76.3895475 36.7923124, -76.3912641 36.7886006, -76.3921224 36.7848887, -76.3866292 36.7810391, -76.3809644 36.7799392, -76.3692914 36.7776018, -76.3665449 36.7774643, -76.3627683 36.7765019, -76.3595067 36.7748519, -76.3584768 36.7711393, -76.3579618 36.7671515, -76.3552152 36.763026, -76.3505804 36.7613757, -76.3488637 36.7615133, -76.3473188 36.7623384, -76.3438856 36.7623384, -76.3397657 36.7612382, -76.3341009 36.7620634, -76.3263761 36.7619258, -76.308695 36.7613757, -76.2917005 36.7597254, -76.2867223 36.7595879, -76.2765943 36.7602755, -76.2731611 36.7620634, -76.2733327 36.7635761, -76.2723028 36.7655013, -76.2685262 36.767289, -76.2647497 36.767289, -76.2625181 36.7641262, -76.2618314 36.7597254, -76.2685262



United States Department of Interior
Fish and Wildlife Service

Project name: I-64 Widening & Bridge Replacement

36.757525, -76.2754184 36.7554757, -76.2880956 36.7546368, -76.2990819 36.7558746, -
76.3160764 36.7569748, -76.3402807 36.755737, -76.3432332 36.7547605, -76.346821
36.7548637, -76.3542968 36.7567823, -76.3610517 36.7612382, -76.3632833 36.7659139, -
76.3670598 36.7663264, -76.3706647 36.7693517, -76.3722097 36.7729269, -76.3795911
36.7745769, -76.3907491 36.7776018, -76.3964139 36.7799392, -76.3989803 36.7817266, -
76.4072286 36.782689, -76.4077436 36.7876383, -76.4044906 36.7901266, -76.4034692
36.7913982, -76.40258604 36.79161776)))

Project Counties: Chesapeake, VA



United States Department of Interior
Fish and Wildlife Service

Project name: I-64 Widening & Bridge Replacement

Endangered Species Act Species List

Species lists are not entirely based upon the current range of a species but may also take into consideration actions that affect a species that exists in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Please contact the designated FWS office if you have questions.

There are no listed species identified for the vicinity of your project.


Species Conclusions Table

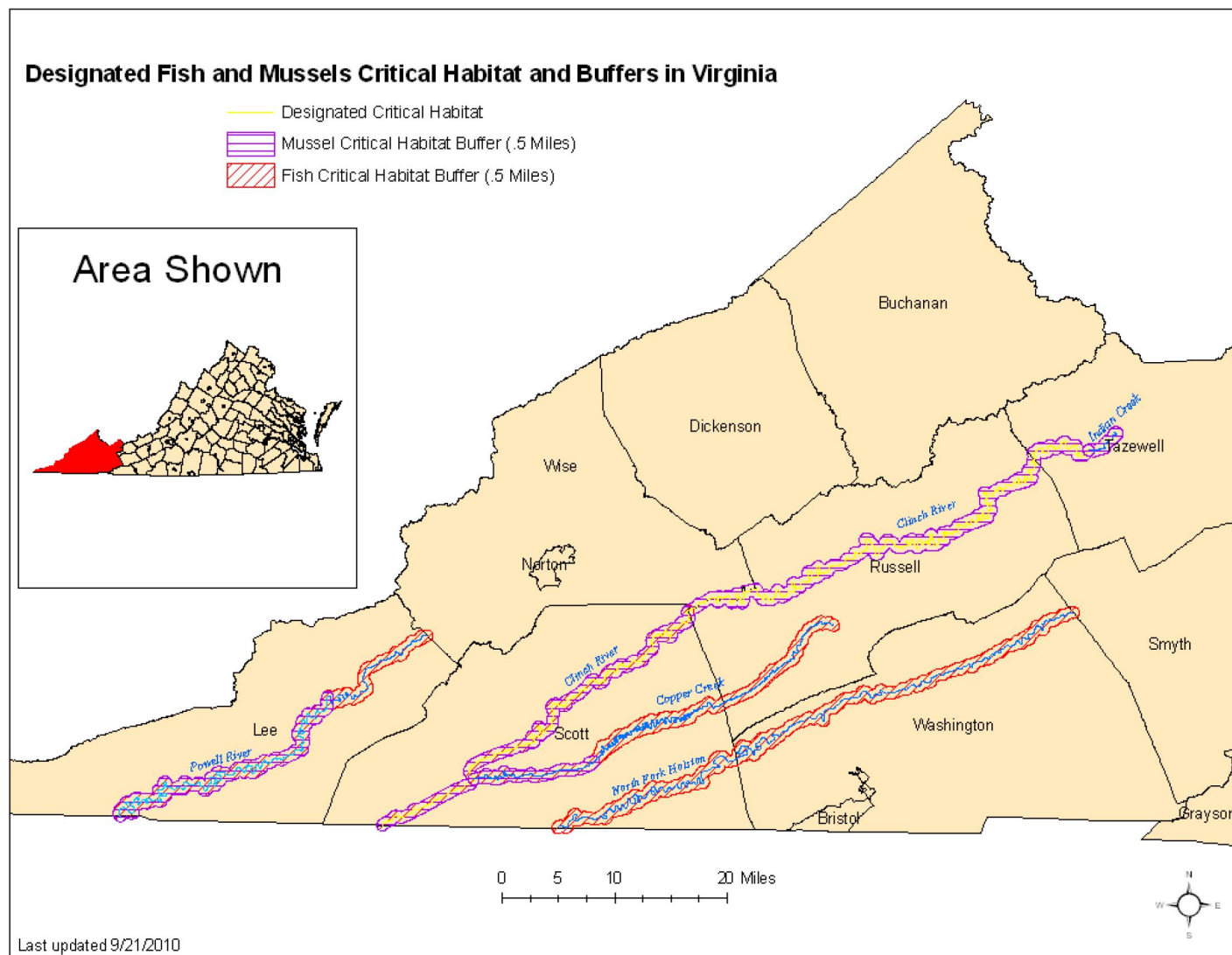
Project Name: I-64 Widening and High Rise Bridge Replacement

Date: September 24, 2013

[illegible]

Click along any of the rivers in the general area of your project site, and it will open an Adobe PDF format map.

Within the PDF map use the Marquee Zoom tool  to zoom to your project area to determine if your project lies within fish and/or mussel designated critical habitat.





Layers

Bald Eagle

Eagle Nests

Eagle Nest Buffers 330'/660'

Waterbirds

Colonial Waterbirds 2013

Chesapeake Bay Herons 2013

Colonial Waterbirds 2008

Colonial Waterbirds 2003

Osprey

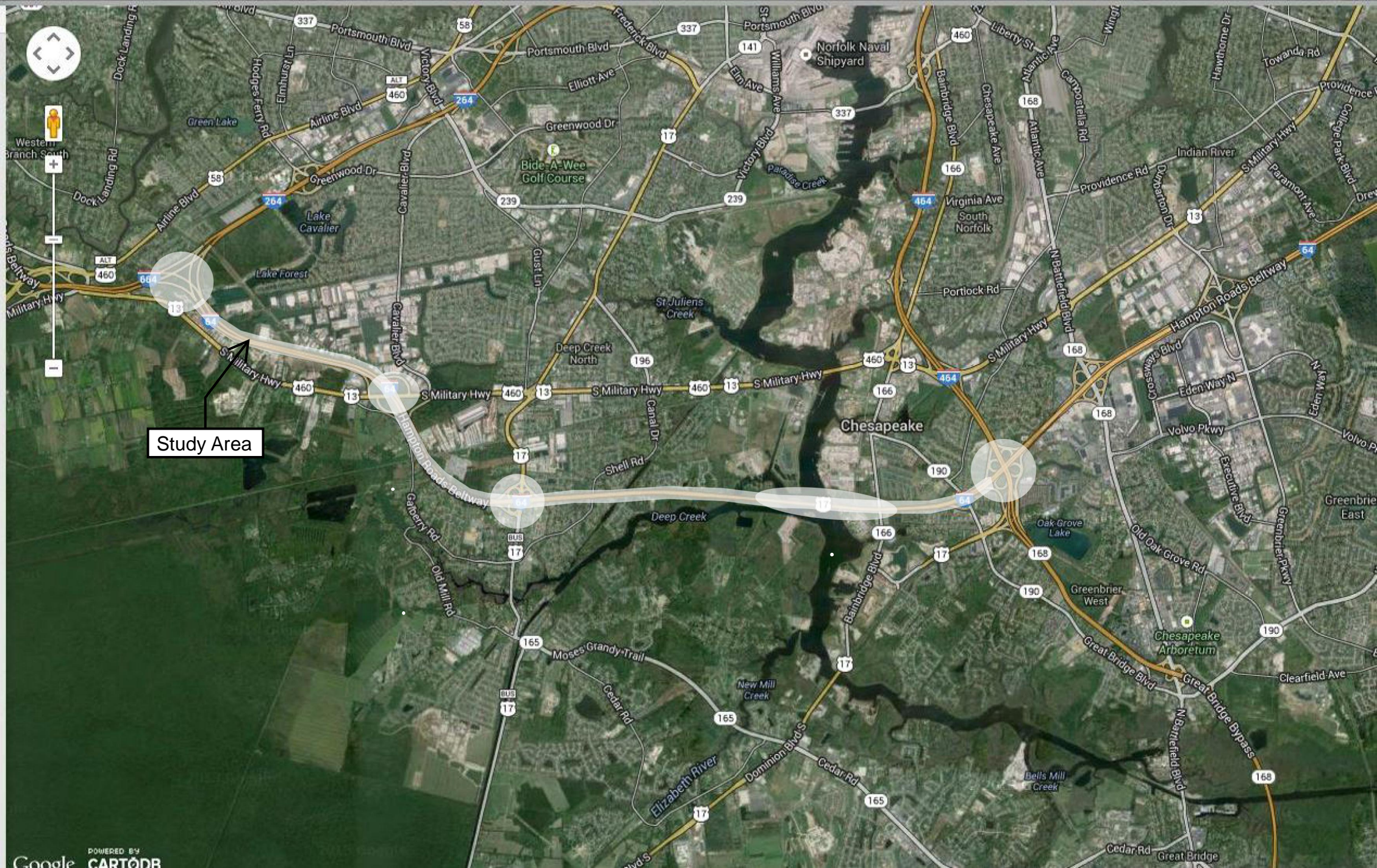
OspreyWatch Nests

Chesapeake Bay Osprey Nests

1995-1996

Other Species

Nightjar Survey Network Routes






APPENDIX G: DCR-NHP DATABASE SEARCH

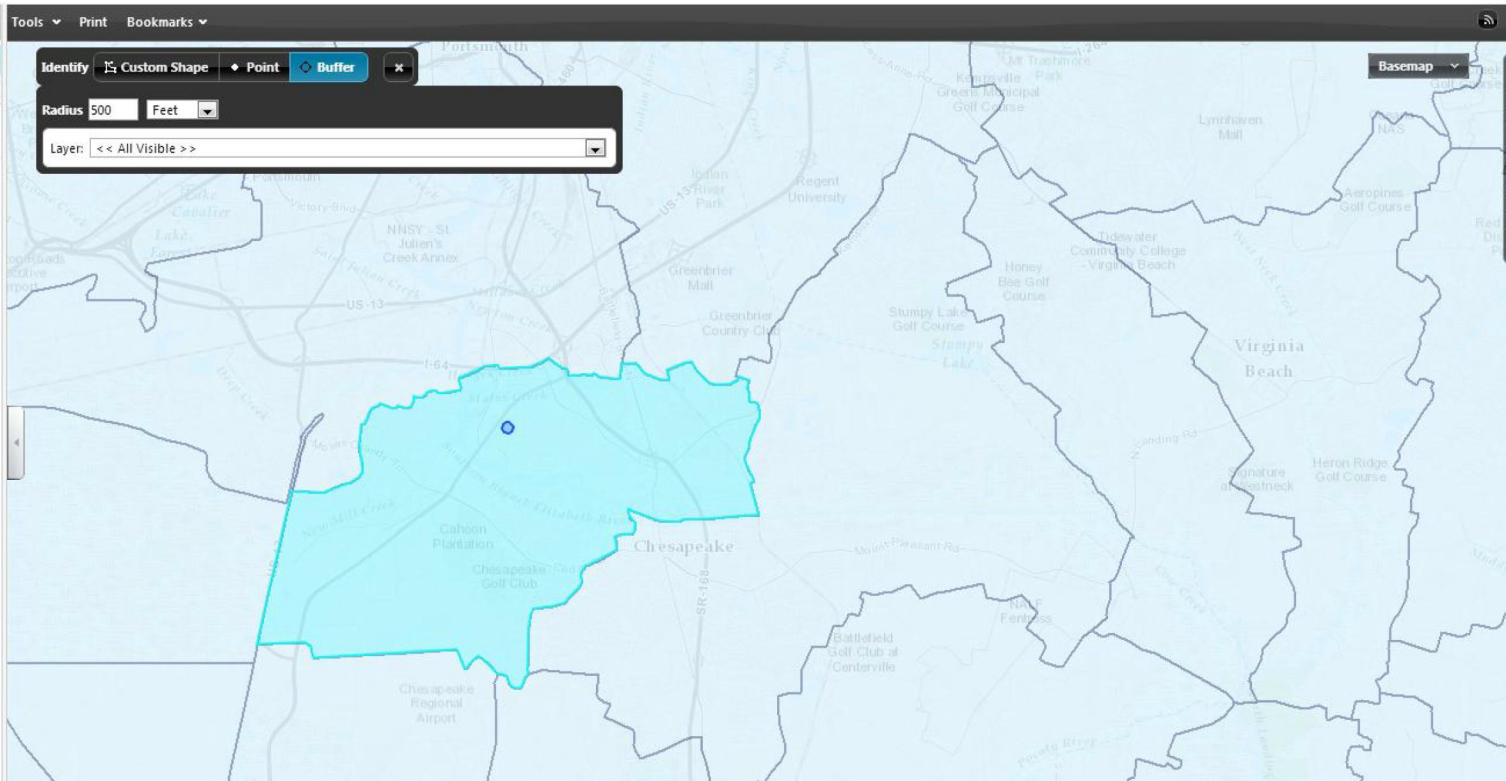
Map Results

(1) Hydrologic Unit Boundaries (HUC) [remove](#)

Tools AREA_ 

☒ JL-K [more info...](#)

AREA_: 68407897.15561
PERIMETER: 42719.16458
VANWBD_L_: 1068
VANWBD_L_ID: 789
VAHU5: JL-K
VAHU6: JL51
ALB Acres: 16899.69965
Shape.area: 106663458.74267194
Shape.len: 53326.341548282355



Natural Heritage Resources

Your Criteria

Watershed: 02080208 - Hampton Roads

Subwatershed: JL51 - Southern Branch Elizabeth River-New Mill Creek

Search Run: 9/24/2013 16:18:54 PM

Click scientific names below to go to NatureServe report.

Click column headings for an explanation of species and community ranks.

Common Name/Natural Community	Scientific Name	Global Conservation Status Rank	State Conservation Status Rank	Federal Legal Status	State Legal Status	Statewide Occurrences
Hampton Roads						
Southern Branch Elizabeth River-New Mill Creek						
LEPIDOPTERA (BUTTERFLIES & MOTHS)						
Little Metalmark	Calephelis virginiensis	G4	S1	None	None	11
King's Hairstreak	Satyrium kingi	G3G4	S2	None	None	8
MAMMALS						
Dismal Swamp Southeastern Shrew	Sorex longirostris fisheri	G5T4	S2	None	LT	8
VASCULAR PLANTS						
Raven's	Ludwigia ravenii	G1G2	S1	SOC	None	7

Common Name/Natural Community Seedbox	Scientific Name	Global Conservation Status Rank	State Conservation Status Rank	Federal Legal Status	State Legal Status	Statewide Occurrences
--	-----------------	---	--	--	--	--------------------------

Note: On-line queries provide basic information from DCR's databases at the time of the request. They are NOT to be substituted for a project review or for on-site surveys required for environmental assessments of specific project areas.

For Additional Information on locations of Natural Heritage Resources please submit an [information request](#).

To Contribute information on locations of natural heritage resources, please fill out and submit a [rare species sighting form](#).

Map Results

(1) Hydrologic Unit Boundaries (HUC) [remove](#)

Tools AREA

☒ JL-K [more info...](#)

AREA: 116729650.88341

PERIMETER: 65730.93517

VANWBD_L: 1011

VANWBD_L_ID: 753

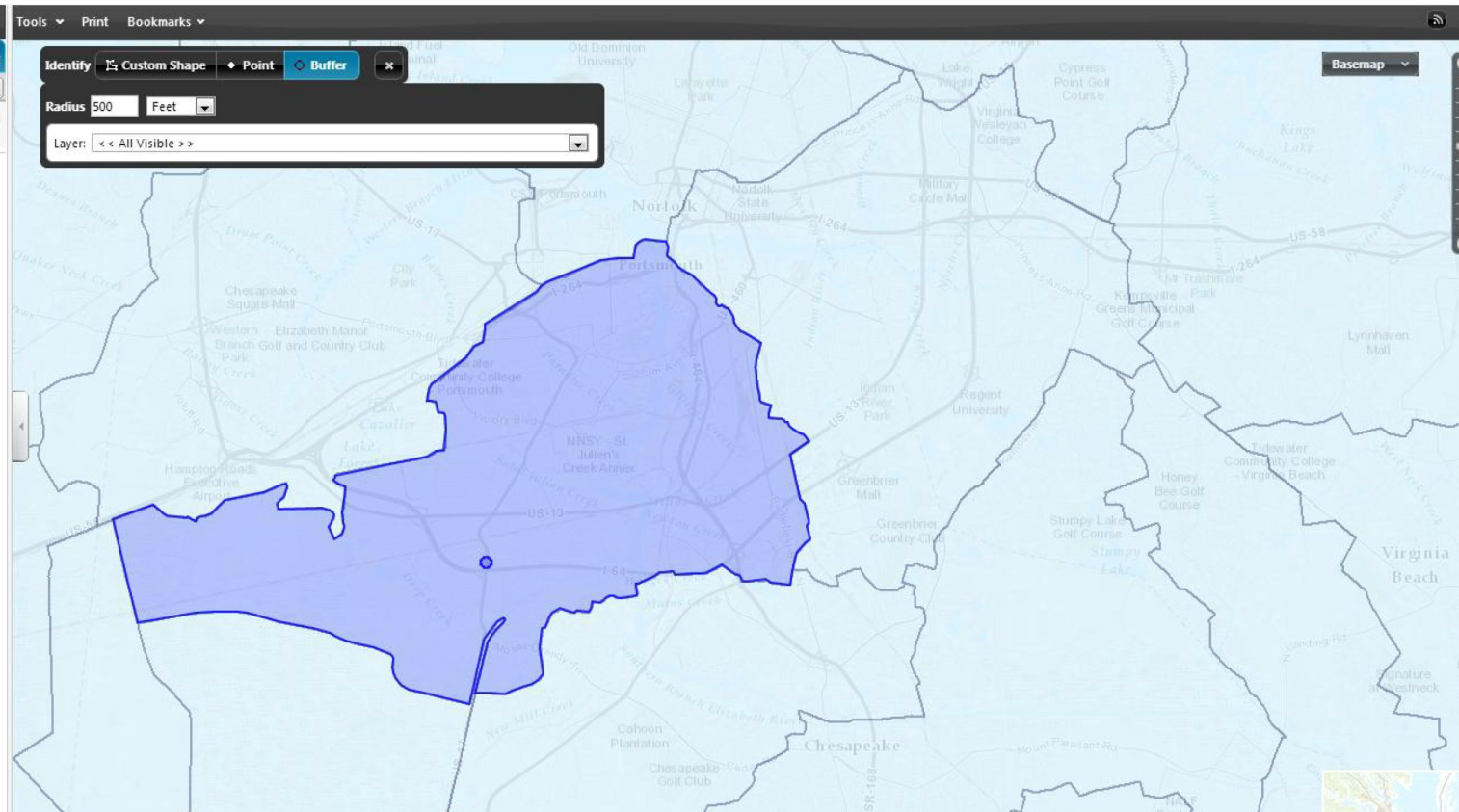
VAHUS: JL-K

VAHU6: JLS3

ALB_ACRES: 28838.64624

Shape.area: 182268978.81515056

Shape.len: 82105.01664240668



Natural Heritage Resources

Your Criteria

Watershed: 02080208 - Hampton Roads

Subwatershed: JL53 - Southern Branch Elizabeth River-Deep Creek

Search Run: 9/24/2013 16:15:03 PM

Click scientific names below to go to NatureServe report.

Click column headings for an explanation of species and community ranks.

Common Name/Natural Community	Scientific Name	Global Conservation Status Rank	State Conservation Status Rank	Federal Legal Status	State Legal Status	Statewide Occurrences
Hampton Roads						
Southern Branch Elizabeth River-Deep Creek						
LEPIDOPTERA (BUTTERFLIES & MOTHS)						
Yucca Giant Skipper	Megathymus yuccae	G5	SH	None	None	2
King's Hairstreak	Satyrium kingi	G3G4	S2	None	None	8
MAMMALS						
Dismal Swamp Southeastern Shrew	Sorex longirostris fisheri	G5T4	S2	None	LT	8
REPTILES						
Canebrake	Crotalus	G4T4	S1	None	LE	19

Common Name/Natural Community	Scientific Name	Global Conservation Status Rank	State Conservation Status Rank	Federal Legal Status	State Legal Status	Statewide Occurrences
Rattlesnake	horridus [Coastal Plain population]					
VASCULAR PLANTS						
Big gallberry	Ilex coriacea	G5	S2	None	None	9
Raven's Seedbox	Ludwigia ravenii	G1G2	S1	SOC	None	7
Lax Hornpod	Mitreola petiolata	G5	S1	None	None	9
Walter's paspalum	Paspalum dissectum	G4?	S2	None	None	13
Fringed yellow-eyed grass	Xyris fimbriata	G5	S1	None	None	4

Note: On-line queries provide basic information from DCR's databases at the time of the request. They are NOT to be substituted for a project review or for on-site surveys required for environmental assessments of specific project areas.

For Additional Information on locations of Natural Heritage Resources please submit an [information request](#).

To Contribute information on locations of natural heritage resources, please fill out and submit a [rare species sighting form](#).

Map Results

(1) Hydrologic Unit Boundaries (HUC) [remove](#)

Tools AREA_ [more info...](#)

☒ JL-K

AREA_: 102553694.04196

PERIMETER: 50342.20041

VANWBD_L: 991

VANWBD_L_ID: 746

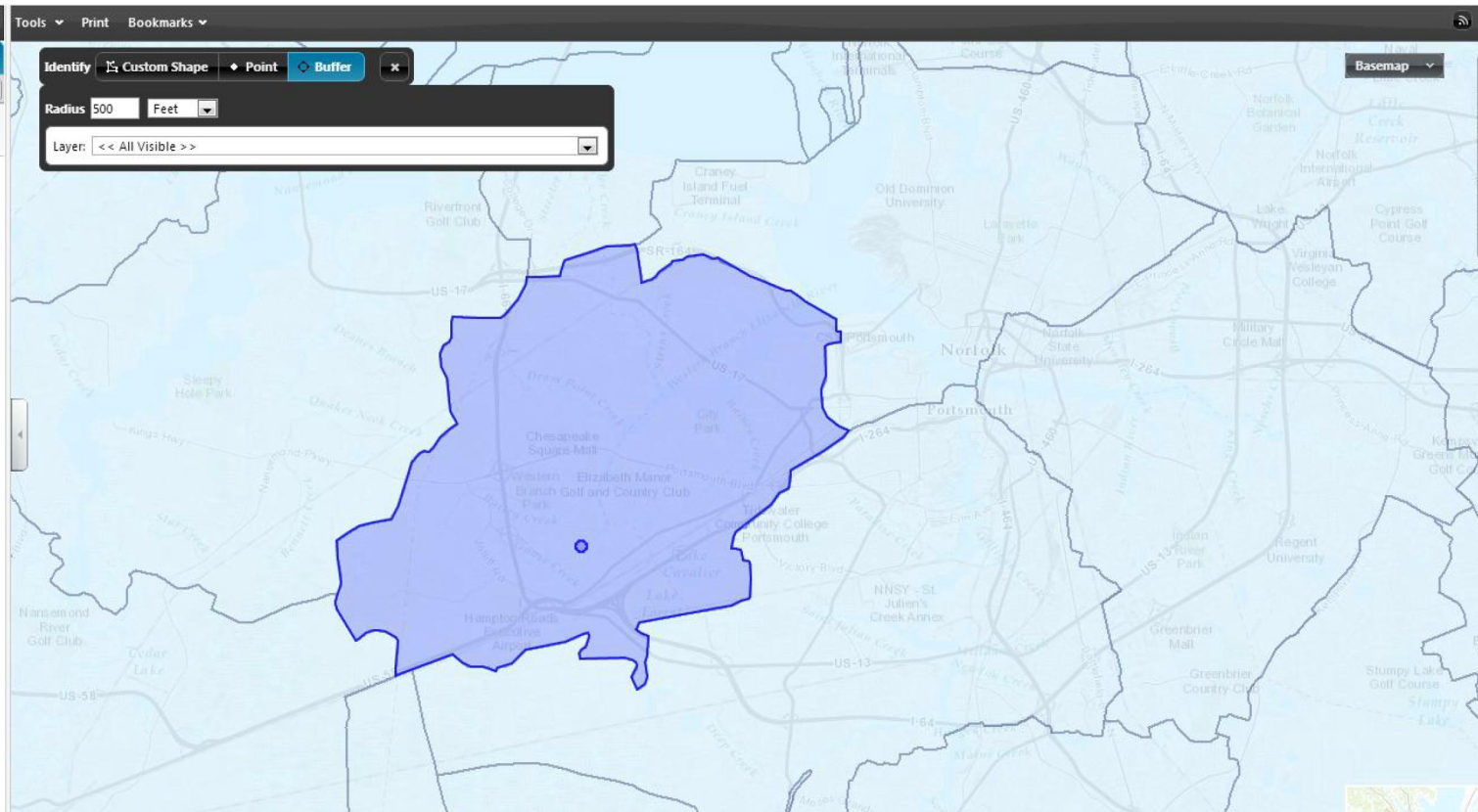
VAHUS: JL-K

VAHU6: JL55

ALB_ACRES: 25337.35045

Shape.area: 160316996.89147058

Shape.len: 62928.064622179416



Natural Heritage Resources

Your Criteria

Watershed: 02080208 - Hampton Roads

Subwatershed: JL55 - Western Branch Elizabeth River

Search Run: 9/24/2013 16:17:33 PM

Click scientific names below to go to NatureServe report.

Click column headings for an explanation of species and community ranks.

Common Name/Natural Community	Scientific Name	Global Conservation Status Rank	State Conservation Status Rank	Federal Legal Status	State Legal Status	Statewide Occurrences
Hampton Roads						
Western Branch Elizabeth River						
AMPHIBIANS						
Oak Toad	Anaxyrus quercicus	G5	S2	None	None	9
BIRDS						
Great Egret	Ardea alba	G5	S2S3B,S3N	None	None	11
Peregrine Falcon	Falco peregrinus	G4	S1B,S2N	None	LT	26
MAMMALS						
Dismal Swamp Southeastern Shrew	Sorex longirostris fisheri	G5T4	S2	None	LT	8

Common Name/Natural Community	Scientific Name	Global Conservation Status Rank	State Conservation Status Rank	Federal Legal Status	State Legal Status	Statewide Occurrences
NON-VASCULAR PLANTS						
Peatmoss	Sphagnum flavicomans	G4	SU	None	None	1
REPTILES						
Canebrake Rattlesnake	Crotalus horridus [Coastal Plain population]	G4T4	S1	None	LE	19
VASCULAR PLANTS						
Lax Hornpod	Mitreola petiolata	G5	S1	None	None	9
Elliott's Aster	Symphyotrichum elliotii	G4	S1	None	None	4

Note: On-line queries provide basic information from DCR's databases at the time of the request. They are NOT to be substituted for a project review or for on-site surveys required for environmental assessments of specific project areas.

For Additional Information on locations of Natural Heritage Resources please submit an [information request](#).

To Contribute information on locations of natural heritage resources, please fill out and submit a [rare species sighting form](#).